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Pulp and Paper Situation Much Confused

Critical Situation In Pulp Industry Due To Suspension of Scandinavian Pulp Shipments Creates Confused Market Situation Here —No Immediate Scarcity Likely Unless Buying Splurge Starts.

The extension of hostilities to Norway which has stopped pulp and paper production in that country and the possibility that Sweden may become involved in the conflict, has created widespread anxiety in this country and uncertainty regarding the future. At this date the outlook is so confused that no definite analysis of the pulp and paper situation can be accurately presented. Pulp prices are nominal and while no advances have been reported in paper, many manufacturers have withdrawn list prices.

Paper Situation Discussed

The Scandinavian and domestic pulp situations were discussed at the regular weekly luncheon of the Salesmen's Association of the Paper Industry held at the Hotel Lexington, New York, on April 15.

Johannes Westergaard, vice-president of Atterbury Brothers, and president of the Association of American Wood Pulp Importers, who had been scheduled to speak on conditions in Norway, was unable to be present. In his absence K. O. Wholley of the Waterfalls Paper Mills, and R. Westad of Borregaard Company spoke on the German invasion of Norway and its significance to the pulp industry. Other speakers who contributed to the discussion were M. C. Bobrow, secretary of the Writing Paper Manufacturers Association, R. S. Kellogg, secretary of the Newsprint Service Bureau, and W. H. Kenety, managing director of the Book Paper Manufacturers Association.

It was pointed out that most of the pulp and paper mills in Norway are situated in the southern part of that country a large part of which is now occupied by Germany. Latest reports indicate that all mills had stopped operations but were intact.

In reference to Finland it was stated that while the pulp and newsprint mills retained by Finland after the peace negotiations with Russia, had increased production but Russian influence would be a factor in Finnish pulp and paper exports in the future. Mining and naval operations by the belligerent powers in the Baltic and other northern waters must also be considered as a factor likely to impede shipments from Finland.

The opinion was expressed at the meeting that total stocks available to the domestic paper industry are somewhat larger than commonly believed to be the case. The opinion was also expressed that the shortage of pulp would likely be felt most acutely next summer and in the unbleached sulphite grade. The point was brought out that the problem of shortage in some grades of pulp would probably be met by domestic paper manufacturers by substituting other grades of pulp for the grades which have been preferred in normal times.

In reference to newsprint it was stated that no shortage was foreseen as domestic manufacturers had ample capacity to produce all domestic newsprint requirements and that Canada could provide for the needs of South America and other countries.

Government Reports on Pulp Trade

WASHINGTON, D. C., April 17, 1940—Wood pulp and paper comprise a relatively large proportion of United States imports from northern countries, except Denmark, said the Department of Commerce last week in discussing trade with the Scandinavian countries. The statement was made in connection with the present trend of hostilities in the Scandinavian countries. The Department said further:

Wood pulp imports from Norway, Sweden and Finland constituted 64 per cent of the total quantity of United States imports of wood pulp in 1939 as compared with 66 per cent in 1938. This represents about 14 per cent of the United States consumption of wood pulp. Four-fifths of U. S. imports from Sweden, nine-tenths from Finland and over one-fourth from Norway are of pulp, paper and paper materials. Imports of wood pulp from Norway and Sweden have increased substantially since the outbreak of the war. The low prices of wood pulp prevailing in the first three quarters of 1939 held down the value of our total pulp imports from these countries.

Although imports of newsprint from the area declined heavily after the outbreak of the war, receipts of this commodity from Finland and Norway for the year as a whole set a new record. Imports of newsprint from these three countries amounted to 11 per

(Continued on page 24)

40 Cent Minimum Wage for Paper Industry

Is Recommended In Majority Report of Industry Committee No. 11 — Does Not Believe That This Rate Will Be A Controlling Factor In Causing Curtailment of Employment In Any Class of Mill Within Industry.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 17, 1940—Majority Report and Recommendation of the Industry Committee No. 11 for the establishment of a minimum wage rate in the pulp and primary paper industry was made last week to the Administrator of the Wages and Hours Division of the Department of Labor.

The minority report has not yet been filed. The majority report is as follows:

Report and Recommendation

By Administrative Order No. 41, dated February 16, 1940, Industry Committee No. 11[1] was appointed for the purpose of recommending the highest minimum wage, which will not substantially curtail employment, for all employees engaged in the Pulp and Primary Paper Industry as defined by said Administrative Order as follows:

> For the purpose of this order the term "pulp and primary paper industry" means the manufacture of pulp, for any purpose, from fibrous material capable of yielding cellulose fiber and the manufacture of paper and of board from such pulp and from such fibrous material or either of them with or without addition of any non-cellulose fiber, colorant or filler.
>
> The term "manufacture" as used in this order means all operations involved in the production of pulp, paper, and board, starting with the unloading of raw materials at the mill site and ending with the delivery of the finished paper or board to carriers for sale as such or to converting departments within the same mill or company. It includes finishing operations normally performed in the paper or board mill, such as packing, trimming, cutting to size, sorting, plating, sizing, super-calendering, and other processing, but does not include any treating, processing or refabrication of finished paper or board to produce converted paper or board products.

In accordance with the provisions of the Fair Labor Standards Act and rules and regulations promulgated under it, the Committee has investigated conditions in the Pulp and Primary Paper Industry and, having due regard to economic and competitive conditions, has recommended the minimum wage rate appearing below.

The committee convened on March 18, 1940, organized and heard reports on basic wage data and facts about the industry presented by representatives of the Wage and Hour Division and the Bureau of Labor Statistics.[2] Supplementary information was obtained during the five-day session of the Committee from the American Paper and Pulp Association, the National Paperboard Association and the interested trade unions.

The committee received and evaluated, among other materials, a detailed explanation of the industry and the workers covered by the definition, general economic data with respect to the industry and the various parts thereof which included detailed statistics as to the wage structure and employment in the industry, and information with respect to competitive conditions as affected by production, transportation, and living costs. It further considered material with respect to collective labor agreements and wages voluntarily maintained by the employers.

The committee determined that labor and production costs will not be affected by the establishment of the recommended minimum to an extent which will substantially curtail employment or cause material dislocation in the industry as now carried on. It found that none of them justified a classification of minimum wages for the purpose of recommending the highest possible minimum wage rate which will avoid substantial curtailment of employment in any branch of the industry. The Committee, therefore, by a vote of ten to eight, on March 22, 1940, made the following recommendation for a minimum wage rate for the entire industry:

> "Wages at a rate of not less than forty (40) cents an hour shall be paid under Section 6 of the Fair Labor Standards Act of 1938 by every employer to each of his employees in the Pulp and Primary Paper Industry who is engaged in commerce or in the production of goods for commerce."

In making this recommendation the committee considered, among other relevant factors, the following: competitive conditions as affected by transportation, living, and production costs; the wages established for work of like or comparable character by collective labor agreements negotiated between employers and employees by representatives of their own choosing, and the wages paid for work of like or comparable character by employers who voluntarily maintain minimum-wage standards in the industry.

Analysis of the Evidence

ADEQUACY OF INFORMATION

After hearing the reports of the governmental research agencies and after considering what additional pertinent information would be available, the Committee debated whether any further investigation should be made and whether any other witnesses

[1] FOR THE PUBLIC: John A. Lapp, Chairman, Chicago, Illinois; Wayne Lyman Morse, Eugene, Oregon; Sumner Huber Slichter, Cambridge, Massachusetts; William John Wilgus, Washington, D. C.; Henry A. Grady, New Bern, North Carolina; Mrs. Elizabeth Brandeis Raushenbush, Madison, Wisconsin.

FOR THE EMPLOYEES: H. W. Sullivan, Washington, D. C.; Frank P. Barry, Albany, New York; Charles O. Dunton, Rumford, Maine; Maxwell Loomis, Port Townsend, Washington; Paul Phillips, Mobile, Alabama; Ray Thomason, Richmond, Virginia.

FOR THE EMPLOYERS: J. D. Zellerbach, San Francisco, California; Dwight Stocker, Plainwell, Michigan; Stuart E. Kay, New York, New York; W. J. Alford, Jr., Ridgefield Park, New Jersey; L. J. Parant, Woodland, Maine; Alan G. Goldsmith, Chillicothe, Ohio.

Arthur D. Hill, Sr., Boston, Mass., replaced Sumner H. Slichter, who resigned. Administrative Order No. 42, dated March 6, 1940.

A. R. Heron, San Francisco, Cal., replaced J. D. Zellerbach, who resigned. Administrative Order No. 44, dated March 13, 1940.

[2] On March 11, 1940, there were mailed to each member of the Committee for prior study the following documents:

U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *United States Pulp and Paper Industry*, 1938.

U. S. Department of Labor, Bureau of Labor Statistics, Division of Wage and Hour Statistics, *Hourly earnings in the Paperboard Industry, November—December 1939.*

U. S. Department of Labor, Wage and Hour Division, Research and Statistics Branch, *Report on the Pulp and Primary Paper Industry.*

should be called or invited to appear. Members of the committee, representing all interested groups, agreed that the data in hand were adequate to enable the committee to arrive at a minimum wage recommendation. Accordingly, the committee voted without dissent, on March 19, 1940, to dispense with the summoning of witnesses and with the scheduling of any formal public hearing.

Definition of the Industry

The definition of the Pulp and Primary Paper Industry, which was used as a basis for the data presented to the committee, excludes the making of all converted paper products. The industry, as defined, begins with the unloading of raw materials at the mill site and ends with the delivery of finished paper or paperboards to storage, to a common carrier or to the converting department. This definition was discussed by the committee and consideration was given to the matter of recommending some modification to the Administrator. However, no specific proposal for amendment of the definition was made.

Establishments, Investment, Employment and Wages

Statistics presented to the committee show that there are 841 pulp, paper and paperboard mills, distributed over 38 of the 48 states. Plant investment aggregates 1½ billion dollars, not including large investments of paper mill companies in timber lands, power facilities and other related properties. The value of annual production amounts to about 900 million dollars, or six-tenths of the direct investment.

The industry, as defined, employed 129,000 wage earners in 1939 at average wages of 62.3 cents an hour. It is not, by any standard, a low-wage industry. Data from the detailed wage surveys as submitted to the committee show that the workers who earn less than 40 cents an hour number 8,425, or 6.5 per cent of all those in the industry, and that those who earn less than 35 cents an hour number 2,159, or 1.7 per cent of all those in the industry.

Direct Effects of a Forty-Cent Minimum

(a) Effect on Wage Bills. The data submitted to the committee show that the raising of all wages to a level of 40 cents an hour, without any other changes, would increase the average wage bill of the industry as a whole by 45/100 of one per cent. This increase would raise the present average wage from 62.3 cents an hour to 62.58 cents, an average rise of 28/100 of one cent per hour. For comparison, it may be noted that the level of average wages rose by 16.7 cents, namely from 45.2 cents an hour in 1932 to 61.9 cents in 1939.

Naturally, the effect of a 40-cent minimum wage would not be uniform in all parts of the industry. The committee examined the data to determine where the 8,425 workers who earn less than 40 cents an hour were located and where the effect of a 40-cent minimum would be the most pronounced. It finds that the lower-paid workers are employed in plants of all sizes, in plants located in communities of all sizes, in plants making each class of product and in plants located in each region except the Pacific Coast Although some portions of the industry would bear a greater wage-bill increase than others, a 40-cent minimum would not result in a very large increase in the wage bill of any substantial group of mills.

The direct effect of raising the wages of all workers to 40 cents an hour would be to increase the wage bill of mills which are primarily engaged in making wrapping paper by 0.70 per cent, and the corresponding increases in pulp, writing paper and paperboard mills would amount to 0.60 per cent, 0.53 per cent and 0.47 per cent, respectively. The direct effect on mills making each of the other paper products would be smaller than any of those just indicated.

The direct effect on mills in the different regions would be, in the case of pulp and paper mills, to increase the average wage bill by 2.35 per cent in the Southern region and by 0.98 per cent in the East Central region; and in the case of paperboard mills, to increase the average wage bill by 2.12 per cent in the Southern region and by 1.85 per cent in the East Central region. In all the other regions, the effects would be smaller than those just stated.

The data indicate that there is no need to establish two or more minimum wage rates within the industry for the purpose of avoiding any substantial curtailment of employment. The committee finds that a 40-cent minimum wage would not occasion substantial curtailment of employment in any important segment within the industry, and finds therefore no basis for classification.

(b) Effect on Costs. The average ratio of labor cost to the total cost of production in this industry is estimated to be 23 per cent, with ratios rising to 30 per cent in some classes of plants. Using the higher labor-cost ratio of 30 per cent, the direct effect of a 40-cent minimum may be estimated to require an average increase in production cost of 14/100 of one per cent ($0.3 \times 0.45 = 0.14$). This increase in cost would amount to an average of less than 10 cents per ton on the products of the industry whose average value in 1937 was $69.15 a ton. On the various classes of paper products, the average increases in cost would range from 23/100 of a cent in the case of newsprint valued at $38.00 per ton to 53 cents a ton on absorbent paper, valued in 1937 at $160.15 a ton.

The relative insignificance of the cost-increases, resulting directly from a 40-cent minimum wage, may be indicated by comparison with some fluctuations in the price of paper in the past. Thus, the wholesale price of book paper dropped from $5.75 to $4.40 per 100 pounds between 1929 and 1932, a drop of $37.00 a ton, and then rose to $5.52 per 100 pounds in 1939, a change of $22.40 per ton. Newsprint prices fell from $62.00 per ton in 1929 to $40.00 in 1934, a drop of $22.00, and then rose to 50.00 in 1939, an increase of $10.00 per ton.

Indirect Effects of a Minimum Wage

The committee recognizes that the effects of the minimum recommended, or of any other minimum, would not be confined entirely to those employees within the definition who now receive less than the minimum. The wages of certain other workers may be indirectly influenced. Although these indirect effects would not be required by the wage order itself and would not be completely evident for some time after the wage order became effective, the committee has given them due consideration.

The precise extent of possible indirect increases in wages cannot be measured statistically, for the reasons described below. However, the record provides ample indication that such indirect increases as might occur would not be great enough to alter the conclusions regarding a 40-cent minimum drawn from the evi-

(Continued on page 26)

Chicago Market Stirred by Pulp Situation

Great Interest Displayed By Paper Merchants In Midwest Market Over Critical Foreign Pulp Situation But No Important Price Changes In Paper Reported To Date — Test State Tax Ruling — Power Conference.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., April 15, 1940—A rather quiet paper market has turned into the exciting market of early last Fall according to Chicago paper executives who are carefully checking the situation in Norway and Sweden. Soaring pulp prices, withdrawal of prices by those vitally affected by this situation and the general uncertainty would seem to have changed the market from a "buyers market" to a "sellers market." This week, locally, the price situation indicated no changes but the same uncertainty of September is repeating itself.

While no specific changes are noted in the actual grades of paper and while demand has made no noticeable jumps upward, indicating that both buyer and seller are carefully surveying the situation—krafts, sulphites, groundwoods, books, covers and virtually grades are looking to the European situation and the scarcity of pulp as something to contend with. One Chicago paper executive has stated that the "events of the week simply put into concrete action a situation which has been prevalent and which has been talked about for some time."

Test Sales Tax Ruling

Paper manufacturers and jobbers concerned over the effects of Revised Article 5 of the Illinois Retailers Occupation Tax Act and its relation to interstate shipments of merchandise, will not have long to wait to determine the legality of the new regulation. Former Senator James Monroe is bringing a test case arising from his refusal to pay an added expense charged by a Pennsylvania manufacturer shipping goods into this State. Five coal trade suits have been filed by members of the Coal Trade Association of Indiana. The suits will be on the following basis:

(1.) On behalf of an Indiana producing company which maintains a sales office in Chicago and is licensed to do business in Illinois.

(2.) On behalf of an Indiana producing company that sells through a sales agent incorporated under the laws of Illinois and domiciled in the state but is not affiliated with the producing company.

(3.) On behalf of an Indiana sales company incorporated under the laws of Indiana and with an office located in Illinois and licensed to do business in Illinois.

(4.) On behalf of a sales agent domiciled in Illinois and incorporated under the laws of Illinois and

(5.) On behalf of an Indiana producing company which maintains no office in Illinois but which makes its sales in Illinois through salesmen traveling out of its Indiana office.

Each of these five suits have a specific interest to the paper trade and their outcome will be followed closely by those who, though in another industry, have a similar distributive situation in Illinois.

The new revised ruling includes three requirements for the taxability of receipts from interstate commerce where the shipment originates outside Illinois: (1) there must be a sale at retail made in this State (2) the seller must be engaged in the business of selling tangible personal property in this State and (3) possession of the property must be transferred to the buyer in Illinois.

Power Conference Largely Attended

The third annual Midwest Power Conference, was held April 9-10 at the Palmer House, Chicago, with a record attendance showing a 50 per cent increase over last year. The Conference, sponsored by Armour Institute of Technology, in cooperation with seven middlewestern colleges and universities, and several local and national engineering societies, was attended by over 600 engineers, educators and professional men throughout the United States interested in the Nation's power problems.

The Midwest Power Conference, according to Professor Stanton E. Winston, director of the conference, was reorganized in 1938 as a cooperative institution with college and university and technical society association. The major responsibility was centered in Armour Institute of Technology which operates the conference with the cooperation of the several state universities and colleges and the technical societies.

"How well the Conference is being received by leaders in the power field," stated Professor Winston, "is evidenced by the increased participation of these men in this rapidly developing institution. When a Conference can present a coverage of the power field from hydro to Diesel to steam to gas turbines, from central power plants to small industrial plants, from the technical through the social aspects of these developments, and when such a Conference can command some of the foremost authorities in the power field as speakers, with an audience of 400-450 at an individual session, that Conference has definitely established a place for itself in the line of march of technical progress."

The purpose of the Power Conference has been established as that of offering an opportunity for all persons interested in power production, power consumption or power transmission to meet together annually for the study of mutual problems free from the restrictions of required membership in technical or social organizations. Academic sponsorship permits the freest possible discussion ranging from the technical through the economic and into the social aspects of the subject. "It is with this purpose in mind," said Professor Winston, "that the Conference functions with the active cooperation of every registrant as a member of the Conference, rather than as a guest."

The university representatives and the universities assisting in the operation of the conference were: M. P. Cleghorn, Iowa State College; H. O. Croft, State University of Iowa; Ben G. Elliott, University of Wisconsin; L. S. Foltz, Michigan State College: L. E. Grinter, Armour Institute of Technology. C. Francis Harding, Purdue University; H. E. Keeler, University of Michigan; and O. A. Leutwiler, University of Illinois.

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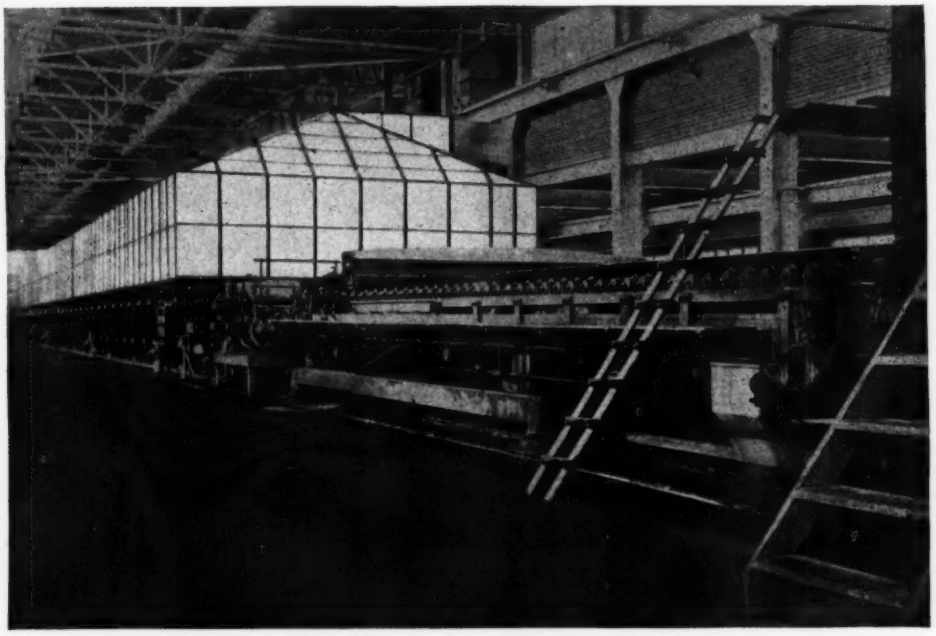

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Philadelphia Concerned Regarding Pulp

Price Withdrawals In Some Instances Are Reported — Philadelphia Paper and Cordage Association Holds Its Annual Shad Dinner At Hotel Philadelphian — 250th Anniversary of Paper Making To Be Celebrated.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., April 15, 1940—Business in the paper industry in Philadelphia is experiencing the stimulus that it enjoyed in the last quarter of 1939, which primarily is due to the influence of conditions in Europe. Until they are settled one way or the other, it is the concensus of opinion here that the importation of pulp from Scandinavia to this country will be uncertain which has caused mills in some cases to withdraw prices.

Paper Men Have Shad Dinner

Despite the inclement weather on Friday last, one hundred and twenty-five members and guests of the Philadelphia Paper and Cordage Association, Inc., met at Hotel Philadelphian, 39th and Chestnut streets, for their annual shad dinner. This is always a gala event but this year surpassed all others. President George K. Hooper presided, and in his inimitable way took his listeners on a journey down "Memory Lane." Among other things, Mr. Hooper cited the history of the Association which he said had its inception in 1926 at the Ben Franklin hotel where nine paper merchants, feeling there was a necessity for an organization to promote good fellowship, met and organized The Philadelphia Paper & Cordage Association. During the years that followed the members met at the Poor Richard Club, then back again to Ben Franklin Hotel, and later the Hotel Adelphia where they have assembled regularly each month until this past year when it was decided to make the Arcadia Restaurant its permanent headquarters. The Association was incorporated in 1937. The first shad dinner was held in 1932 under the chairmanship of the late Leslie Bartlett, The first Christmas Party was held in 1933 at which time 12 children from the Salvation Army were guests of the members. So successful was this Christmas Party and the interest created thereby, these little wards numbering sixty were entertained this past Christmas at the Arcadia Restaurant by the members of the Association, the success of which President Hooper said "is due in no small measure to the efforts of the Women's Auxiliary of the Association under the able chairmanship of Mrs. E. K. Lay, wife of a former president of the Association." Continuing, he said it was estimated that a quarter million dollars have changed hands among members in the last three years, based on the fact of so many carloads where mills are permitted to buy and sell.

E. L. Richards of Buffalo Envelope Company, and chairman of the Golf Committee, announced the schedule of tournaments for the coming season.

At the conclusion of the dinner it was moved that night telegrams be sent to Mrs. Leslie Bartlett and Sam Shryock. It will be remembered that Mrs. Bartlett's late husband was chairman of the Association's first shad dinner in 1932. Sam Shryock of Shryock Bros., whose untiring efforts on the Entertainment Committee helped make these occasions outstanding in the annals of the Association, has been confined to his home because of a recent indisposition.

Among Those Present

Present among the guests were Carroll T. Gardner, representative of Groveton Paper Company, Inc., Diamond Mills Paper Company, and Henle Wax Paper Manufacturing Company, Inc.; William E. Sullivan, Philadelphia Representative of Mohawk Paper Mills, Inc., Cohoes, N. Y., and Robert E. Barnes of Eastern Corporation, Bangor, Maine.

As a finale to a very enjoyable dinner and interesting addresses, Jack Shinners of Acme Specialty Company and chairman of the entertainment committee, arranged a floor show which was one of the highlights of the evening. John S. Heverly of Garrett-Buchanan Co., and Richard W. Gifford of H. M. Gifford Tag Mfrs., were in a tough spot as stooges for the magician who cleverly executed some unusual tricks. Excitement was rife when Mr. Heverly had his necktie cut in two pieces and when through the art of magic an egg deposited in the pocket of Mr. Gifford there emerged a live baby chick.

Robert Gair Co. Buys Building

Robert Gair Company, Inc., 155 East 44th street, New York City, which has a branch sales office in the Liberty Trust Building, Arch and Broad streets, Philadelphia, announce the purchase of the Canada Dry Building, a one-story brick structure, containing approximately 70,000 square feet of manufacturing space, located at the corner of Rhawn and Tacony streets, Philadelphia. This property has a railroad siding on the Pennsylvania Railroad main line, near the Holmesburg Junction Station. In addition to the building itself, the property has several acres of land available for expansion.

In the interest of service to its customers in the Middle Atlantic States, and especially in the vicinity of Philadelphia, there will be installed in this property complete equipment for the manufacture of corrugated shipping cases, floor display stands, and other corrugated products.

Rittenhouse To Be Honored

William Rittenhouse, who established the first paper mill on the banks of the Wissahickon in 1690, will not be the "forgotten man" of the 1940 celebration, marking the 250th anniversary of Wissahickon community. While thought has been given to honoring the early settlers, nothing definite had been done to pay tribute to Rittenhouse up to this time. Now, however, offers of cooperation have come from a number of states, from Massachusetts, Illinois and our own Pennsylvania. Monday, July 1 has been definitely set as the date on which fitting respect will be paid to William Rittenhouse by Wissahickon and the surrounding communities of Roxborough, Manayunk, East Falls and West Manayunk.

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Wisconsin Plans Record Planting This Year

Most Extensive Spring Planting Ever Undertaken By State Begins Distribution of 12,000,000 Trees—Pulp Bleaching Co. Moves To Wausau and Forms An Operating Alliance With the D. J. Murray Mfg. Company.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 15, 1940—Twelve million trees will be distributed for planting in Wisconsin by the Central State Nursery, operated by the Wisconsin Conservation Commission at Wisconsin Rapids, Wis. The deliveries will be made between April 15 and May 15 and will represent the most extensive spring planting ever carried on in the state. Approximately 7,000,000 trees will be planted on state and county forest lands, and five million on farms and other private lands. The major part of the work will be done by CCC and WPA workers.

Pulp Bleaching Co. Moves to Wausau

The pulp Bleaching Company of Orange, N. J., has moved to Wausau, Wis., and has established an operating alliance with the D. J. Murray Manufacturing Company, makers of paper mill equipment. Lack of pulp imports from the Scandinavian countries has caused an increased demand for the company's machinery and processes, and orders totalling $150,000 are already under production since the move was completed, according to Raymond P. Hill, president of the pulp company. The firm has acted as consultants and engineers on pulp bleaching since 1924, and has had its orders for equipment under its own patents manufactured in various plants.

It is the company's plan to continue to operate as an independent concern, but its manufacture will be handled 100 per cent by the Murray company. This firm is one of the leaders in this highly specialized field, and has made 70 to 80 per cent of the high grade bleaching installations in the world. A bleach plant, considered one of the finest in the industry, was installed recently at the Woodfibre, B. C. plant of the British Columbia Pulp and Paper Company. The company is associated with the Pulp Bleaching Company, Limited, of Montreal. Among its installations are seven in Finland, the latest of which was destroyed by bombers during the recent Russian invasion.

W. H. Swanson Presides at Patent Observance

Walter H. Swanson, Neenah, Wis., recently elected president of the Technical Association of the Pulp and Paper Industry, presided at the host table for the pulp and paper industry representatives at the Mayflower Hotel, Washington, D. C., Wednesday of last week, during the United States Patent Law Sesquicentennial Celebration. Mr. Swanson is superintendent of sulphite mills for the Kimberly-Clark Corporation, and was a member of the national committee for the sesquicentennial observance.

Badger Mill Works Want Closed Shop

Efforts to force a closed shop at the Badger Paper Mills, Inc., Peshtigo, Wis., were to be considered at a mass meeting of workers Sunday, April 14, at Peshtigo, with rumors action might be taken for a strike. Members of the International Brotherhood of Papermakers and the Pulp, Sulphite and Paper Mill Workers claim there has been a deadlock for three months over a contract, and now have a hearing pending before the National Labor Board on charges of unfair labor practices. The company itself recently made charges against the unions with the Wisconsin Labor Relations Board involving the forcing of workers to join the unions. The unions point out that the company has closed shop contracts with bookbinders and pressmen, but has refused to grant a closed shop to the mill workers.

B. T. U. Team Wins Bowling Series

Bowlers of the B. T. U. team won the season's championship of the Kimberly-Clark Bowling League at Neenah, Wis. Its members are R. Sabee, E. Isakson, captain, E. Jacobi, W. Beerman and G. W. Gibson. The term had 46 victories to its credit, and rolled the high team series for the season.

Reineck-Ragland Engagement

The engagement was announced last week of Edward A. Reineck of Appleton, Wis., and Miss Ruth Ragland of Elmhurst, Ill. Mr. Reineck is a graduate of Lawrence College and is a technical assistant at the Institute of Paper Chemistry, Appleton. The wedding will take place this summer, following Miss Ragland's graduation from Lawrence College.

Cromwell Paper Co. Builds

One of the most rapid programs of expansion in the Chicago industrial area is being rounded out by the construction of the third large addition within eight years to the plant of the Cromwell Paper Company, 4801-35 South Whipple street, Chicago, paper converters and manufacturers of Cromwell tympan, Cromwell waterproof shipping papers, Crom-Pax mothproof bags and Crom-Tex laminated household specialties. According to Joseph Weil, president of the company, the new section will provide additional floor space required by increased production and expanded manufacturing plans. Reported cost of the building and land is $100,000.

The original plant with 25,000 square feet of floor space was built in 1924. The second unit of 22,290 square feet was built in 1932. The third unit of 27,200 square feet was added in 1935. The fourth unit, now under construction, is 25,000 square feet and will increase the total area of the building to 99,490 square feet and the total frontage on Whipple Street to 400 feet. The new section blends architecturally with the first three units. All are of pressed brick construction with terra cotta trim, one story high, with a wood truss roof, insulated and sky-lighted. The entire plant is sprinkler equipped and the offices are air conditioned. The new section will have 100 foot frontage on Whipple Street and an average depth of 250 feet. It will be equipped with a new enlarged power plant and contain a two-truck shipping court.

MOLINE FLIGHT CONVEYORS *not only look better*

...they perform better too!

● Designed with long link chain because it is stronger pound for pound than equivalent sizes of "pin type" chains —flights that link integrally into the strand instead of merely fastening onto the chain, and many other proven and exclusive features, Moline Flight Conveyors are establishing outstanding performance records. Moline Flight Conveyors can be used on quite long "centers" avoiding the necessity—and cost—of installing several shorter conveyors to cover an equivalent distance. They scrape clean, instead of riding over the material, and are widely used, in preference to all other conveyors, by many of the best known and most successful mills for handling pulp wood—and hog fuel, edgings, cuttings, slabs, saw dust, etc., because they save 25% to 50% of the first cost, 15% to 30% of the power requirement, and provide 15% to 25% more capacity. Full proof of these claims is available on request.

Investigate the savings you can make by using Moline Flight Conveyors in your mill. A descriptive catalog giving full details, a list of typical users, and other helpful information is available on request. There's no obligation. Send the coupon for your catalog today.

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(4)

Canada Planning to Increase Production

Prospective Cutting Off of Pulp and Newsprint Exports From Scandinavia Encourages Canada To Make Arrangements To Increase Present Output To Meet Expected Heavy Demand — Liquefying Wood Method.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 15, 1930—The prospective cutting off of all pulp and newsprint exports from Scandinavia to the United States as a result of the latest turn in the war in Europe has enormously stimulated interest in the pulp and paper industry in Canada, and arrangements are already under way for greater output in Canada in order to meet the prospective heavier demands on the industry here.

As far as newsprint is concerned, an emphatic "yes" is given to the question as to whether or not Canada can supply all that is needed to replace Scandinavian supplies and it is further stated that within a comparatively short time the added supplies of pulp could also be made forthcoming from pulp mills now working below capacity or actualy idle.

Canada's Pulp and Paper Production

In this connection the Montreal *Herald* quotes and confirms figures given in a review of Canada's pulp and paper industry in the Convention Number of the PAPER TRADE JOURNAL, published in February 22nd last.

"Normally," it says, "the United States imports from Scandinavian countries 250,000 to 300,000 tons per annum. These supplies are now cut off, but they can be replaced with ease by Canada. The productive capacity of Canadian newsprint mills in 1939 was 4,293,361 tons per annum, while the actual production was 2,861,202 tons. Thus Canada can produce 1,432,159 more tons per annum than was produced in 1939. In other words, Canada can replace the whole of the supply formerly coming from Scandinavia and still have a surplus capacity of a million tons per annum. In fact, Canada could easily take care of the whole of the normal newsprint export trade of Finland, Sweden, Norway and Germany, amounting to some 950,000 tons per annum, and still have a substantial surplus capacity."

Regarding pulp, the *Herald* says: "Canada's production of pulp is also far below capacity; in fact there are pulp mills in Canada which have been idle for years. Last year the United States imported 870,000 tons of pulp from Sweden, 335,000 tons from Finland, and 95,682 tons from Norway, a total from the three countries of 1,070,682 tons. Canada's production can be stepped up to meet the added requirements of the American market within a reasonable time. Meanwhile many American users of pulp are reported to have ample supply of wood pulp at their mills and warehouses to cover requirements for about a year ahead and the majority are well supplied for several months."

A Method of Liquefying Wood

Professor Harold Hibbert, of McGill University, who a year ago announced discovery of a way to convert wood into vanilla flavoring, now has another discovery to his credit—that of a method of liquefying wood so that it can be boiled "like water in a tea kettle." On Wednesday last week he described the method to the members of the American Chemical Society in Cincinnati, O., and a despatch from that city published here, says:

"The steam of the boiling wood can be separated into all the primary, commercially valuable chemicals that form the original wood. Each kind of wood chemical boils at a different temperature. The industrial name of the process is distillation.

"Professor Hibbert uses a new method of liquefying wood, by subjecting it to high pressures in a sealed tank whose atmosphere is pure hydrogen. The resulting liquid is about as clear as water. He said the raw materials in this liquid wood hold great promise for future new synthetic organic chemicals.

"One substance which boiled off the liquid wood, he said, possibly can be substituted for coal as a raw material for manufacture of the new fibre, nylon."

Mersey Paper Co. Expands

Col. C. H. L. Jones, president of the Mersey Paper Company, has announced that the company has under way a large extension to their pier warehouse at Liverpool, N. S., where its plant is situated. The company's plant has a capacity of 650,000 lbs. of newsprint per 24 hours. Its groundwood and sulphite pulp mills are equipped with 14 magazine grinders and three digesters and produce ground wood and sulphite fiber.

Gair Piermont Plant Gets Plaque

At a dinner held at Schmidt's Closter Manor, Closter, N. J., on the evening of April 6, 1940, attended by the managers, superintendents, foremen and safety council of Gair Cartons Division (Piermont) of Robert Gair Company, Inc., New York, and guests, Frederick Ashbridge, of the New York office of Liberty Mutual Insurance Company, Boston, presented to the Piermont plant a handsome metal plaque, reading: "Awarded to Robert Gair Company, Inc., Gair Cartons Division, in recognition of the outstanding safety record made by their employees in working without a lost time accident for 1,000,000 man hours, from July 3, 1939 to January 30, 1940."

Mr. Ashbridge remarked that this impressive record is even more remarkable because of the fact that the plant had run up a record of 750,000 safe hours, which was broken by one accident, and immediately started on the million hour record. Therefore, the record is not only a million hours without a lost time accident, but one and three-quarters million hours with only one lost time accident.

Edmund Moore, personnel manager and chairman of the Safety Council at the Piermont plant, was toastmaster at the dinner. Among those who spoke briefly were: Norman F. Greenway, first vice-president; Harry Van Decker, assistant manager folding carton divisions; George E. Rogers, manager, Insurance Department, New York office; Dennis Hogan, mill superintendent and mayor of Piermont; and Henry Rust, production manager at Piermont.

A few of the Pennsylvania Salt Manufacturing Company chemical products:

CHLORINE	ACID-PROOF CEMENTS
CAUSTIC SODA	SODIUM ALUMINATE
ALUM	AMMONIA
PERCHLORON	BLEACHING POWDER
SODA ASH	

PULP AND PAPER MILLS in all parts of the country have learned that they can rely fully on this Company for quick and careful service in supplying liquid chlorine.

The product is of high and uniform quality, going far to insure the smooth operation of your processes. All Pennsylvania Salt liquid chlorine containers, whether small cylinders, multi-unit or single unit tank cars, receive the most exacting attention to every detail that makes for safety and cleanliness.

You are assured of speedy delivery to any point, because your order is followed through without delay from the time it is received until the shipment reaches your plant. Our technical service is available to help in the application of our liquid chlorine to your mill processes.

Have you a copy of our valuable wall placard, listing 20 important suggestions on the handling of liquid chlorine? It is free to chlorine users on request. Write us today.

PENNSYLVANIA SALT MANUFACTURING COMPANY
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PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for the Week Ending April 17, 1940

	High	Low	Last
A. P. W.	4	3½	4
Armstrong Cork Co.	42¼	40¼	40¾
Celotex Corp.	11⅜	10	10¼
Celotex Corp., pf.	70	69	69
Certain-Teed Products Corp.	6¾	6¼	6⅜
Certain-Teed Products Corp., pf.	30¾	28½	30
Champion Paper & Fibre Co.	29½	26	29½
Congoleum-Nairn Co.	23⅝	22½	22½
Container Corp. of America	18	16⅞	17½
Continental-Diamond Fibre Co.	9¼	8½	8¾
Crown-Zellerbach Co.	19	17⅛	18¾
Crown-Zellerbach Co., pf.	94	92¼	93⅝
Flintkote Co.	20¼	19¼	19½
Robert Gair	4⅝	4	4⅜
Robert Gair, pf.	16½	16	16⅛
International Paper & Power	19⅜	15⅝	19⅜
International Paper & Power, pf.	67⅞	61½	67⅞
Johns-Manville Corp.	72¼	70	70¾
Johns-Manville Corp., pf.	126¾	126	126
Kimberly Clark Corp.	45	40¼	45
MacAndrews & Forbes	35	34	35
MacAndrews & Forbes, pf.	136	135	135
Masonite Corp.	35	33½	33½
Mead Corp.	13¾	12¼	13¾
Mead Corp., pf.	69	67½	68
Paraffine Companies, Inc.	44½	44	44
Paraffine Companies, Inc., pf.	100¾	100¾	100¾
Rayonier, Inc.	23¼	19⅜	23⅛
Rayonier, Inc., pf.	32⅞	30½	32¾
Ruberoid Co.	20⅝	19⅛	19⅞
Scott Paper Co.	46⅜	42⅛	43
Scott Paper Co., pf.	108	107	107
Sutherland Paper Co.	33¼	30⅝	30⅝
Union Bag & Paper Corp.	18⅛	15⅜	18
United Paperboard Co.	6⅞	6	6⅝
U. S. Gypsum Co.	85½	84	84¾
U. S. Gypsum Co., pf.	180	180	180

New York Curb Exchange

High, Low and Last for the Week Ending April 17, 1940

	High	Low	Last
American Box Board Co.	7¾	6¾	7½
Brown Co., pf.	31¼	28½	31¼
Great Northern Paper	47¼	43¾	47¼
National Container Corp.	11⅝	10¾	11½
St. Regis Paper Co.	4⅛	3½	4⅛
St. Regis Paper Co., pf.	76	72	76
Taggart Corp.	5⅞	5½	5½

Kimberly-Clark Bond Issue Approved

NEENAH, Wis., April 15, 1940—Stockholders ot Kimberly-Clark Corporation, Neenah, Wis., voted at the annual meeting at the company's offices Thursday of last week to approve a new issue of first mortgage bonds not to exceed $20,000,000, according to announcement of J. Frederick Hunt, secretary.

It is planned to issue $12,000,000 as security for a 12-year loan from banks and the Northwestern Mutual Life Insurance Company, Milwaukee, Wis., and to retire at a premium $8,800,000 worth of 4½ per cent bonds due in 1952. Another $3,000,000 will be used to finance an expansion program, of which approximately $1,000,000 will be used in Neenah.

All of the officers and directors were reelected as follows: F. J. Sensenbrenner, president; Ernst Mahler, executive vice-president; S. F. Shattuck, John S. Sensenbrenner, C. A. Sage and C. G. Parker, vice-presidents; J. F. Hunt, secretary and comptroller; W. H. Clifford, treasurer, and F. E. Sensenbrenner, assistant secretary-treasurer. Other members of the board are H. J. Boon, Appleton, Wis.; C. B. Clark, Neenah, Wis.; John M. Hancock, New York; Walter Kasten, Milwaukee, Wis.; J. C. Kimberly and J. R. Kimberly, Neenah, Wis.

Kimberly-Clark Nets $745,045

The report of the Kimberly-Clark Corporation and its subsidiaries for the quarter ended March 31, shows a net profit of $745,045 after depreciation, interest, Federal income taxes and after a provision of a reserve of $150,000 for contingencies. This is equivalent, following allowance for dividends on the 6 per cent preferred stock, to $1.22 each on 488,173 shares of common stock and compares with a net profit of $598,660, or 92 cents a share, in the same period last year.

Net profit of the corporation and its subsidiaries for the twelve months ended on March 31 was $2,797,750 after charges and Federal income taxes and was equal to $4.51 each on 488,173 shares of common stock following allowances for dividends on the 6 per cent preferred issue. For the twelve months to March 31, 1939, the corporation had a net profit of $1,936,269, or $2.74 a share, on the common stock.

Union Bag Elects Officers

At the annual stockholders' meeting of Union Bag and Paper Corporation held in Jersey City April 9, all of the present directors of the company were reelected and a Contingent Compensation Plan was authorized by assent of 95 per cent of the stock voted. Sixty-eight per cent of the outstanding shares were represented by proxy or in person.

To illustrate the effect of improved price levels, Alexander Calder, president, stated that earnings of the corporation for the first two months of 1940 were $503,211 or more than half of the net profit reported for the entire preceding year. Sales are now running at the rate of $20,000,000 a year, Mr. Calder said.

Mr. Calder also referred to the invasion of Scandinavia as reported in this morning's newspapers, pointing out that this further aggravated the threat of a shortage of pulp and expressed the opinion that this basic pulp condition would reflect itself in the domestic paper markets very promptly.

Rayonier To Call Certificates

Rayonier, Inc., has issued notice regarding scrip certificates for preferred and common shares of the company issued in lieu of fractional shares against the stocks of the several companies combined into Rayonier late in 1937. The certificates expired at the close of 1939. In accordance with the certificate of incorporation, the registrars in San Francisco sold on Jan. 3, 1940, 83 preferred shares at $28.36 each and 251 common shares at $18.75 each.

The proceeds were impounded in various banks for redemption of scrip certificates. Holders have been requested to present them at the Chase National Bank here or at the designated Pacific Coast banks for cash.

Hammermill Declares Dividend

The Hammermill Paper Company declared a distribution of 25 cents a share on the common stock, payable April 30 to stockholders of record April 16. A disbursement of 50 cents was made on December 27 last.

THE NEW
WILLIAMS ELECTRIC SMOOTHNESS AND FORMATION TESTER

For the rapid and accurate measure of Finish, Formation, Horizontal Porosity and Printability of Paper.

May also be used as high pressure densometer for thru-and-thru porosity.

ADVANTAGES

Accuracy. Absolutely frictionless. No falling cylinders to rub. Check tests on standard test plates furnished with the instrument show an accuracy better than 1%.

Rapidity. Results obtained in much shorter time than with any other smoothness tester. Time range easily adjusted to suit type of paper.

Easy to Operate. A smoothness or formation test is as easily made as a pop test on a Mullen Tester. No technical skill required.

Automatically Timed with electric stop clock. No tedious waiting with stop watch in hand.

Sturdily Constructed of stainless steel and bronze. No fragile glass manometer tubes, glass joint, or valves to become leaky.

Finish. Entire instrument heavily chrome plated as protection against moisture, corrosion and insuring a permanently clean attractive appearance.

AMERICAN BUILT

WILLIAMS APPARATUS CO., INC.

HERALD BLDG. WATERTOWN, N. Y.

Southern Kraft Nets $2,539,001

The Southern Kraft Corporation reports for 1939 a net profit, after provision for doubtful accounts, interest, amortization of debt, discount and expense, depletion and other charges, of $2,539,001, compared with net profit in 1938 of $1,037,211. The statement of profit and loss and earned surplus follows:—

STATEMENT OF PROFIT AND LOSS AND EARNED SURPLUS

For Year Ended December 31, 1939

SALES AND OTHER INCOME:			
Gross sales, less returns, allowances and discounts—			
Customers	$44,648,755.13		
Affiliated companies	5,100,976.62	$49,749,731.75	
Other income—net		14,920.16	$49,764,651.91
COST AND EXPENSES:			
Cost of sales—			
Pulpwood, labor, materials, etc.		$27,646,536.04	
Maintenance and repairs		3,327,688.65	
Taxes (other than income taxes)		1,060,282.17	
Outward freight and delivery expenses		7,640,681.92	
Selling, general and administrative expenses		1,924,918.08	
Provision for doubtful accounts		300,000.00	41,900,106.86
			$7,864,545.05
DEDUCTIONS:			
Interest to public—funded debt		$614,940.77	
Interest to parent company—			
Funded debt	$716,603.62		
Income notes	1,244,728.02		
Other debt	176,956.09	2,138,287.73	
Amrtization of debt discount and expense		113,729.00	
Depreciation		1,725,459.47	
Depletion		202,030.54	
Provision for income taxes		531,096.00	5,325,543.51
Net Profit for the Year			$2,539,001.54
Earned Surplus—January 1, 1939			2,120,398.84
Profit on Bonds Redeemed during 1939			84,124.12
Earned Surplus—December 31, 1939			$4,743,524.50

Continental-Diamond Profits Up

The Continental-Diamond Fibre Company and wholly owned subsidiaries, for the year ended December 31, report sales of $5,925,144, against $4,148,720; profit $222,610 after taxes and charges, equal to 49 cents a share on 450,000 shares of common stock, compared with a loss of $651,792 in 1938. Consolidated balance sheet items include cash of $502,749, against $328,141; notes and accounts receivable $826,413 against $542,531; inventories $1,990,368; against $1,852,302; current liabilities $638,829, against $395,049.

Sutherland Paper Reports $201,140

The Sutherland Paper Company reports net profit for the March quarter of $201,140, equal to 70 cents each on 287,000 shares of common stock, against $115,652, or 40 cents a share, last year. For the twelve months to March 31, net profit is reported of $808,678 or $2.82 a share, compared with $505,894, or $1.76 a share, for twelve months to March 31, 1939.

United Paperboard Nets $1,542

The United Paperboard Company and subsidiaries, nine months ended February 24, profit $1,542 after taxes and charges, compared with a loss of $15,292 in the nine months ended February 25, 1939

CONSTRUCTION NEWS

New York, N. Y.—The Ever-Ready Label Corporation, 141 East 25th street, manufacturer of paper labels and kindred paper specialties, has leased additional space in building at location noted, providing a total of about 30,000 square feet, and will occupy for expansion in converting and other operating divisions.

Marseilles, Ill.—The Certain-teed Products Corporation, 100 East 42nd street, New York, N. Y., manufacturer of building and roofing papers, prepared roofing products, insulating papers, etc., has plans in progress for new addition to branch plant at Marseilles, to be two-story and basement, equipped for considerable increased capacity. It is reported to cost in excess of $50,000, including equipment. It is proposed to ask bids on general contract at early date.

Pensacola, Fla.—The Armstrong Cork Company, manufacturer of insulation board products, has plans maturing for proposed addition to mill at Pensacola, previously referred to in these columns, and will soon begin work on superstructure. It will be one-story, equipped for expansion in finishing division. Cost estimated in excess of $40,000, including equipment. Main offices of company are at Lancaster, Pa.

Aberdeen, Wash.—Neil Cooney, Aberdeen, a retired lumberman, is interested in a project to construct and operate a local pulp mill. A tract of about 2300 acres of land, owned by Mr. Cooney, is being made available for a site free of cost.

Brooklyn, N. Y.—The Colonial Container Company, organized to manufacture paper bags and containers, has leased space in Building No. 9 at the local properties of the New York Dock Company on waterfront, and will occupy for plant.

Camas, Wash.—The Crown Willamette Paper Company, manufacturer of kraft, tissue and other paper stocks, has awarded general contract to L. H. Hoffman Construction Company, 715 S. W. Columbia street, Portland, Ore., for new addition to mill, previously referred to in these columns. Work on erection will be placed under way at once. New structure will be four-story, 42 x 175 feet, and is reported to cost close to $100,000, with equipment. It will be used for storage and distributing service for paper bag division and other production departments. Company is a unit of the Crown Zellerbach Corporation, 343 Sansome street, San Francisco, Cal.

Cohoes, N. Y.—The Mohawk Paper Mills, Inc., manufacturer of writing and other paper stocks, has superstructure under way on new addition to mill, for which general contract recently was let to J. P. Sewell, Albany, N. Y., and will push to early completion. It will be three-story and basement, about 50 x 160 feet, reported to cost close to $70,000, with equipment, which will provide for increase in present capacity. C. F. Egan, Burdett Building, Troy, N. Y., is architect.

Neenah, Wis.—The Kimberly-Clark Corporation, manufacturer of wall papers and other paper stocks, wadding, cover papers, etc., has begun foundations for proposed new addition to mill on North Commercial street, Neenah, previously noted in these columns, and is awarding sub-contracts for different branches of work. New structure will be two and three-story and basement, about 80 x 230 feet, and will be equipped for addition to the machine division, principally for wadding manufacture. An award for iron and steel work has been made to the A. F. Wagner Iron Works, Milwaukee, Wis.; for glass and glass blocks to the Pittsburgh Plate Glass Company, Pittsburgh, Pa.; and for hollow-metal fireproof doors, to the Richmond Fireproof Door Company, Richmond, Ind. The Siesel Construction Company, 514 East Ogden avenue, Milwaukee, is general contractor. New unit, to be known as Machine Room No. 3, is reported to cost in excess of $100,000, with equipment.

Brantford, Ont.—The Sonoco Products Company of Canada, Ltd., Park avenue, Brantford, manufacturer of chip board and paper products for company conversion for paper tubing, cones, etc., has preliminary plans under way for expansion in plant, including installation of equipment for increased capacity. Work is scheduled to begin soon. Company is a Canadian subsidiary of the Sonoco Products Company, Hartsville, S. C.

Sydney, Australia—The Australian Newsprint Mills, Pty., Ltd., has tentative plans under consideration for the expansion of its new mill now in course of construction at Boyer, near New Norfolk. It is proposed to begin work closely following the completion of the first unit early next fall. Work is progressing rapidly on the initial mill, which will be equipped for a rated production of about 27,000 tons of pulp per annum. The proposed second unit will more than double this output, and will be completed late in 1941. Company has concluded an agreement with the state Hydro Electric Commission for electric power supply for mill service, and construction is now in progress on transmission line extensions to mill site. Further development of hydroelectric power stations, also, is under consideration in connection with present plants at Wadhamana and Tarraleah, to make additional power available for the proposed second mill unit.

New Companies

New York, N. Y.—The Prince Paper Company, Inc., has been organized with capital of 200 shares of stock, no par value, to deal in paper products. New company is represented by Jacob Goodman, 152 West Forty-second street, attorney.

Chicago, Ill.—The Crest Paper and Pad Corporation, 139 North Clark street, has been chartered with capital of 50 shares of stock, no par value, to manufacture and deal in paper specialties, including loose-leaf sheets, pads, tablets, etc. The incorporators include C. H. Collier, D. M. Krichiver and R. J. Golson. The last mentioned, at address noted, is company representative.

New York, N. Y.—The Green View Tissue Mills, Inc., has been incorporated with capital of 250 shares of preferred stock, and 501 shares of common stock, no par value, to deal in tissue and other paper stocks. New company is represented by William Macy, 521 Fifth avenue, New York, attorney.

Pacific TAPPI Meets at Port Angeles

The sixth dinner meeting of the 1939-1940 series of the Pacific TAPPI was held at the Port Angeles Golf Club, Port Angeles, Wash. on the evening of April 9, 1940. It was announced that this was the final meeting of the year as the last scheduled meeting to be held in Vancouver, B. C., was cancelled at the request of the Canadian members who are too occupied with other activities during the war period.

Kenneth Chapman, Technical Department Pulp Division, Weyerhaeuser Timber Company, Everett, gave a paper in the Shibley Award contest entitled "Pulp Moisture Testing." It reviewed testing methods for pulp moisture in common practice. The paper dealt also with the experiences of his company in moisture tests on the pulp sheet leaving the drier, on warehouse storage, immediate shipment in sealed box cars, and boat shipments through the tropical waters of the Panama Canal.

R. E. Chase, R. E. Chase & Co., Tacoma, was drafted at a late hour to give a talk to substitute for the scheduled speaker who was unavoidably detained and could not be present. This talk on "Flow Measurements of Fluids" compared the use of Venturi meters, fixed orifice meters, and rotameters for use in measuring gas and fluid flow. A lively discussion followed on the measurement of liquid chlorine flow and the possibility of adapting rotameters to the flow measurement of low density pulp.

Progress was announced on the organization for the National TAPPI meeting to be held in Seattle, Washington, August 20-23, 1940.

Following is a list of those in attendance at the meeting, Gerald Alcorn, Ray C. Austin, G. Sterling Bailey, C. M. Barr, C. V. Basom, A. F. Benson, Paul W. Blatter, P. Cannon, O. S. Cauvel, E. J. Cavanaugh, Kenneth Chapman, R. E. Chase, N. W. Coster, J. V. B. Cox, E. F. Drake, Harold T. Fretz, Ben G. Gellenbeck, M. S. Gerend, Wm. R. Gibson, George LeRoy Gouker, Howard, Graham, Earl G. Hallonquist, S. H. Harrison, Nelson Q. Hartnagel, W. S. Hodges, Wm. S. Hodgson, Clyde F. Holcomb, Robt. Holcomb, Judson H. Holloway, A. J. Hooper, B. L. Kerns, Glen King, R. A. Lawrence, Don Lawson, R. E. Le Riche, A. H. Lloyd, Wm. M. Locke, Leonard McMaster, G. T. Mickel, Kyle Milligan, R. L. Mitchell, F. A. Morey, C. T. Muledy, E. E. Olfson, F. A. Olmsted, James W. Pence, A. S. Quinn, Fred Radke, M L. Rauch, E. P. Read, Cliff M. Rogers, Walter A. Salmonson, Harlan Scott, Myron A. Scott, A. F. Sheean, Brian Shera, E. C. Sherman, Glenn Simkins, H. N. Simpson, Henry Solbakken, H. A. Sprague, H. E. Springer, James B. Symonds, Robert S. Tabke, E. H. Tidland, L. C. Van Arsdale, J. V. Venables, L. E. Warwick, and James W. Wenger.

To Handle Eastern Line in Detroit

The Eastern Corporation, Bangor, Maine, has appointed the Chope-Stevens Paper Company as its merchant agents in Detroit, Mich.

Important Questions In Buying

LIFT TRUCKS

No. 1. Is the machine ruggedly constructed for long life?

No. 2 Is it fast in lift as well as travel?

No. 3. Can it get around easily in close quarters?

No. 4. Is the lift smooth and precise, for exact placing?

No. 5. Do performance records show low fuel and maintenance cost?

No. 6. What provision does it make for driver's comfort and safety

No. 7. Is it built for 24 hour uninterrupted service at peak capacity?

No. 8. How long has the machine, you are considering, been proved on the job?

No. 9. Will it give you a lower cost per ton moved, because of these performance features?

Write or wire for literature on the lift truck that can answer all the above questions to your complete satisfaction.

TOWMOTOR COMPANY 1220 E. 152nd St., Cleveland, Ohio
Sales Offices in Principal Cities

PULP AND PAPER SITUATION MUCH CONFUSED

(Continued from page 9)

cent of the total newsprint imports into the United States in 1939.

New York Mills Expect to Benefit

DEXTER, N. Y., April 13, 1940—Paper and pulp manufacturers of Northern New York are of the opinion that the entire industry of this country and Canada will be benefitted by the situation in the Scandinavian countries. A prominent manufacturer is quoted as saying that a large number of people will be helped by an improved condition in the pulp and paper industry brought on by a forced curtailment of Scandinavian production. It is his opinion that prices naturally will strengthen although the desire of the industry is that they be held down to reasonable levels and not allowed to reach fantastic heights. He stated that since the war broke out there has been lots of business for the paper industry but prices have been weak. It is hoped that the market shall not be permitted to attain an unreasonable status with the improvement that is at hand.

Among the concerns to be benefitted is the Dexter Sulphite Pulp & Paper Co. which will not only find a ready market for all the pulp it can make, but will also get a better price. The concern will be enabled to make a good profit and thus retire its indebtedness which amounts to about half a million dollars. The newsprint industry, now represented mainly by the Gould Paper Company, Lyons Falls, Algonquin Paper Company, Ogdensburg, and Finch, Pruyn & Company, Glens Falls, will also greatly benefit. It was pointed out also that the St. Regis Paper Company, Knowlton Brothers, Inc., the Taggart Corporation, Brownville Board Company, Brownville Paper Company, National Paper Products Corporation, Carthage Papermakers, Inc., and Island Paper Company will equally benefit. Now that the bulk of the twenty per cent total importation is cut off by the war situation, the result will be that mills in this country and Canada will have to absorb the business which means about 1,350,000 tons of the product in addition to about 225,000 tons of bleached sulphite. The amount of newsprint and other papers actually imported from across the ocean has not been large, the demand being supplied from Canada and this country.

Boston Reports More Active Market

BOSTON, Mass., April 15, 1940—The news from abroad, with the possibility that the supply of pulp from the Scandinavian countries may be cut off, has caused a very active box board market, with an advance in prices of $2.50 to $5.00. Chip board is quotable here at $37.50, news board at $40.00 to $42.50, and single manila lined chip, caliper .020, at $55.

If current conditions continue abroad, the price of waste paper is liable to be affected.

A number of mills have withdrawn prices of kraft paper, a fact which has naturally stimulated placing of orders. It is stated in the trade that coming at this season of the year, the situation ought to produce a nice run of business for the next two or three months. Apparently, there are no large stocks in the hands of jobbers.

G. E. Graham Goes with Sutherland

KALAMAZOO, Mich., April 17, 1940—Glen E. Graham who recently announced his resignation as general manager of the Eddy Paper Corporation, Three Rivers, will become vice president in charge of manufacturing at the Sutherland Paper Company here May 1, the Kalamazoo firm announced today.

Despite the trying economics of the period he has been at Three Rivers, Mr. Graham is credited by officials of the Eddy Paper Corporation with making an "enviable reputation in the management and operations of the company." He is to remain at his Three Rivers post until April 30. A successor there has not been announced.

Native of Gulfport, Miss., Mr. Graham was with the Chicago Mill and Lumber Corporation from 1923 to 1927. In 1927 he joined the Container Corporation of America at the Philadelphia plant, and spent the next 10 years with that company in Philadelphia and Chicago. Nine years of this period he was a member of the staff of the administrative vice president.

In 1932 and the first part of 1933, Mr. Graham spent a year as secretary-treasurer and plant manager for the Bogota Paper and Board Company of Bogota, N. J.

On July 11, 1933, he joined the Eddy Paper Corporation. Six and one-half years of his experience with this firm has been as manager of the Three Rivers plant. All of Mr. Graham's experience in the paper industry has been in the manufacture of paper board.

New Electric Smoothness Tester

The Williams Apparatus Company announces its latest development—a new electric smoothness and formation tester.

The timing is absolutely automatic by means of an electric stop clock. It is frictionless, there being no falling cylinders to rub and check tests show an accuracy of better than 1 per cent.

It is particularly easy to operate, requiring no technical skill. It is only necessary to clamp in the sample, force down the movable cylinder into the mercury cistern, after which the test requires no attention, as the clock is automatically stopped when the mercury level falls below an electric contact point.

International Sets $50 Newsprint Price

The International Paper Company announced on April 15 that, "International Paper Company's president, R. J. Cullen, states that International's current domestic newsprint prices, ($50 per ton), which are now fixed through June, will be extended throughout the third quarter of this year at the present level. These prices now named firm until October 1, 1940, will have remained unchanged since January 1, 1938, a period of thirty-three months during which no advance has occurred. International hopes this degree of stability, particularly in times like these, will benefit its customers throughout the country."

Government Paper Bids and Awards

WASHINGTON, D. C., April 17, 1940—Mudge Paper Company has been awarded the contract for furnishing the Government Printing Office with 56,000 pounds (2,000,000 sheets) of 50 per cent rag, 10½ x 16 M.F. lithograph paper at 8.69 cents. Stanford Paper Company will furnish 6,700 pounds (50,000 sheets) of 38 x 48 blue M.F. book paper at 10 cents. Bids for both of these items were received on March 27.

R. P. Andrews Paper Company will furnish 40,000 pounds of super-calendered book paper in 28½ inch rolls at 4.33 cents, bids for which were received on March 22.

Barton, Duer & Koch Paper Company will furnish 528 pounds (3,300 sheets) of 25 x 38 ivory laid antique book paper at 15.5 cents and the Link Paper Company will furnish 10,000 pounds of oiled manila tympan paper in 38 inch rolls at 7.4 cents. Bids for both of these items were received on March 20.

The Printing Office has received the following bids for 6,240 pounds (40,000 sheets) of 38 x 48 lithograph finish map paper; R. P. Andrews Paper Company, 5.96 cents; Barton, Duer & Koch Paper Company, 6.74 cents; and William Bersch Company, 17 cents.

For 13,800 pounds (300,000 sheets) of 28 x 34 yellow sulphite manifold paper; Import Paper Company, 8.75 cents; Old Dominion Paper Company, 8.74 cents; Whitaker Paper Company, 9.14 cents; Barton, Duer & Koch Paper Company, 9.14 cents; Stanford Paper Company, 7.5 cents; Paper Corp. of U. S., 8.48 cents; Mathers-Lamm Paper Co., 8.88 cents; Charles G. Stott & Company, Inc., 8.75 cents.

For 15,000 sheets of white cardboard: Paper Corporation of U. S., $36.00 per M sheets; R. P. Andrews Paper Company, $36.30; Stanford Paper Company, $36.40; Whitaker Paper Company, $33.92; and Barton, Duer & Koch Paper Company, $36.50.

Paper Customs Cases Decided

The United States Customs Court is clearing the records of several hundred pending cases which have been accumulating since 1931 on the finding by Customs officials that M. G. Kraft wrapping paper, imported from Sweden, had been undervalued.

In its decision the Customs Court ruled that the market "was a controlled market subject to conditions and restrictions fixed by a cartel agreement between wholesalers and dealers" and therefore there was no freely offered foreign value within the meaning of the Tariff Act.

These cases were decided on the basis of a decision which the Department of Justice refused to appeal, in which foreign price fixing is accepted as a legal means by which importers of foreign paper can evade the spirit of the United States tariff laws.

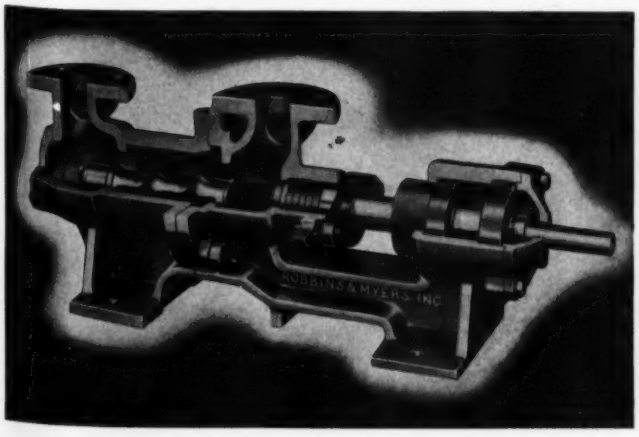
A Philadelphia case in which an importer was held to have undervalued about 1,500 rolls of grey kraft wrapping paper was decided in favor of the importer. The Court held that the failure of a Customs examiner to actually open 150 rolls, or one tenth of the shipment, made the appraisement invalid, and the importer's valuation of the shipment is allowed to stand. The examiner had set aside 150 rolls for inspection because of a question whether the paper was properly marked with the country of origin.

R & M MOYNO SLIP PUMP

Assures Greater Uniformity of Feed to Coating Rolls

The pumping mechanism is the answer. It is simply a single-thread helical rotor turning within a double-threaded helical stator. The resulting action is the same as would be obtained by moving a piston at constant speed through a cylinder of infinite length.

As the rolling action of the rotor is continuous with no lost motion and the displacement cross-section is constant, slip is delivered to the coating rolls from a Moyno Pump with a uniformity that cannot be obtained with any other equipment.



Although the Moyno Slip Pump is as positive in displacement as a piston pump, it is absolutely valveless. Thus, all troubles that might be caused by worn, clogged, leaking or sticking valves are totally eliminated, while the rotor itself definitely seals against forward or backward flow of slip. The valveless feature of the R & M Moyno Slip Pump contributes greatly to its unusually long life in paper industry service.

Complete details on this remarkable pump will be sent you immediately upon receipt of your request. This places you under no obligation. Simply ask for R & M Moyno Slip Pump Folder No. 1753.

ROBBINS & MYERS, Inc.

MOYNO PUMP DIVISION

SPRINGFIELD, OHIO

40 CENTS MINIMUM WAGE FOR PAPER INDUSTRY

(Continued from page 11)

dence as to the direct effects alone.

Two kinds of indirect effects of a minimum wage were discussed at length by the committee:

(1) Wages above the Minimum—the so-called "bumping" of different wage rates which may result in the raising of the wages of some workers who are now receiving 40 cents or more per hour, so as to maintain, partially, the wage differentials which now prevail.

(2) Wages of Employees outside the Definition of the Industry—specifically, the possibility that workers engaged in paper converting operations, in an integrated plant, although not covered by the definition of this industry, might require wage increases in the event of need for a uniform wage policy throughout the plant.

With respect to both of these types of indirect effect, certain uncertainties should be noted. The extent of the indirect wage increases in any particular case will depend upon the particular policy of the individual mill, upon the policy adopted by organized labor in organized plants, upon the wage policies of related industries and of industries located in the same community, upon the relation of the proposed minimum to the existing spread of wage rates in that plant, upon the duration of time under consideration, and finally upon general business conditions.

As regards the increases in wages to employees already receiving 40 cents or more per hour, the committee finds, after considering the various pertinent factors, that the resulting increase in cost to this industry is not likely to be substantial. The most important evidence leading to this conclusion is the wide range of earnings in this industry, extending from less than 40 cents to more than $1.50 per hour. A similar range of earnings is found in each region and among plants making each type of product. It is apparent that wages below 40 cents an hour could be raised to 40 cents, without approaching the present wages of most of the workers in the industry, eighty-four per cent of whom already earn 45 cents or more per hour.

With respect to employees engaged in converting operations in integrated plants, the possible indirect wage increases also are found to be slight. Of nearly 111,000 workers covered by the survey of the American Paper and Pulp Association, as of October 1938, only 13,358 were employed in converting departments of integrated plants, outside of the direct jurisdiction of this committee. Only 2,374 of these 13,358 workers, or less than 18 per cent, were receiving wages below 40 cents an hour. Furthermore, 1,045 of the paper-converting workers, nearly half of the 2,374 who earned less than 40 cents, were receiving wages of either 38 or 39 cents an hour. This latter group would not require appreciable wage increases, even if their wages were to be raised to 40 cents as an indirect result of the proposed minimum.

The workers engaged in paper converting include those who are employed in departments that are separate and distinct from the pulp and paper operations. To that extent, the probability of their receiving indirect wage increases becomes more remote. At least some of the mills having converting departments already pay minimum wages close to 40 cents an hour, and in such mills the indirect effects of the proposed 40-cent minimum would be slight. Finally, the committee is aware that wage rates in the manufacture of converted paper products will be considered by another industry committee in the near future. This committee will be charged with the duty of recommending the highest possible minimum wage rate in that industry up to 40 cents an hour, which will not substantially curtail employment. Once the rate for converted paper products has been established, independent converters as well as the converting departments of integrated mills will come under that rate and the difference, if any, in minimum wages would appear only to the extent that the converted paper rate was less than 40 cents.

The committee therefore finds that the small direct effects of a 40-cent minimum, even when combined with such indirect effects as are likely to occur, would not be sufficient to occasion any substantial curtailment of employment in the Pulp and Primary Paper Industry.

Effect on Small Mills and Small Communities

As previously noted, the committee's attention was not limited to the average effect of various proposed minimum wage rates on the industry as a whole. Consideration was also given to particular groups of mills: those making different products, those located in different regions and those now paying different average levels of wages.

Particular attention was given to the effect of a 40-cent minimum on mills of relatively small size and on mills, whether large or small, which are located in small communities. The evidence on these subjects is believed to be adequate. Detailed wage data were obtained from pulp and paper mills by the American Paper and Pulp Association and from paperboard mills by the United States Bureau of Labor Statistics, in cooperation with the National Paperboard Association. All of these reports were analysed and tabulated by the Bureau of Labor Statistics. The original reports covered more than 30 per cent of all mills which employ 50 workers or fewer and they also covered a representative cross-section of mills located in large and small communities.

While a slightly greater proportion of the small mills than of the large mills in this industry may be paying the lower wage scales, the vast majority of the workers who earn less than 40 cents an hour are employed by the relatively large mills. For example, 87 per cent of the 6,171 pulp and paper mill employees who are estimated to be earning less than 40 cents an hour are found in mills which employ more than 100 workers each. Only 13 per cent are found in mills employing 100 workers or fewer and less than 4 per cent are employed in mills with 50 workers or fewer. In this industry there is no clear correlation between small size and low wage scales. Four of the 13 pulp and paper mills, reporting average wages below 45 cents an hour, had 50 workers or fewer; but 2 of these 13 low-wage mills had from 51 to 100 workers, 3 had from 101 to 250 workers, and 4 had from 251 to 500 workers. Likewise, of the 96 pulp and paper mills reporting fewer than 100 workers each, 25 paid average wages of less than 50 cents an hour, while 57 of these smaller mills paid average wages which ranged from 55 cents to more than 80 cents an hour.

The committee therefore finds that a minimum wage of 40 cents per hour would not cause any special hardship on the smaller mills as a class and that the major cost of raising the minimum wage to 40 cents would fall on the relatively large mills.

The committee also finds that no special hardship would fall on mills located in small communities. The relatively low-wage mills which would face the largest cost-increases are not exclusively, or even generally, located in small communities. Thus, among paperboard mills, wage increases of more than one per cent would result directly from a 40-cent minimum only in those mills which now pay average wages of less than 50 cents an hour. Sixteen of the 31 paperboard mills which were reported as paying average wages of less than 50 cents per hour are located in cities of more than 25,000 population and only 14 are located in towns of less than 10,000 population. Again, of the 69 paperboard mills which were reported as being located in towns of less than 10,000 people, only 14 were reported as paying average wages of less than 50 cents per hour.

There is no evidence before the committee to show than a 40-cent minimum wage would cause the closing down of small mills or the closing down of the mills located in small towns. Doubtless the inefficient mills and the mills located in areas where raw material resources may become exhausted will be closed down in the future, as in the past. However, the evidence before the committee does not reveal a single case of a mill, now competitive, which would be closed to avoid payment of a minimum wage of 40 cents an hour. The statistics which actually are available do not lead the committee to believe that a 40-cent minimum would be a controlling factor in causing curtailment of employment in any class of mill within this industry.

Accordingly, a forty (40) cents minimum wage is recommended for the Pulp and Primary Paper Industry as defined by Administrative Order No. 41.

British Restrict Paper Consumption

"A new paper control order," according to a cable from London, "effective immediately," was announced by the ministry of Economic Warfare.

"The new order will reduce the amount of paper supplied by mills to customers during March, April and May of this year by from 60 per cent to 30 per cent of the amounts supplied during that period in 1939.

"The conflict in Norway has already had an adverse effect on the shipments of newsprint to England. The *News Chronicle*, for example, announced that it and other papers would be reduced to 10 pages beginning today, with further reductions expected in the near future.

"Newsprint prices are nearly double the former rate and may shortly rise again."

Waterfalls Opens Boston Office

The Waterfalls Paper Mills has opened an office at 89 Broad Street, Boston, Mass. The phone is Hancock 4025. Norman Rhoades, who has been covering this territory, will be in charge.

William M. Healy has joined the sales staff of the Waterfalls Paper Mills and will cover the New York City trade.

Ten pair of flanges were eliminated from this one short section of stock line by using ARMCO Spiral Welded Pipe with prefabricated fittings. Think of the time and money saved.

It's easy to cut costs with ARMCO Spiral Welded Pipe. Many paper mills have saved as much as 25 to 30 per cent on a single job.

Here's the reason: ARMCO's "tailored-to-the-job" method of fabricating pipe eliminates unnecessary joints. Standard or special fittings come welded to straight pipe runs. This way you save at least one pair of flanges at every bend. Naturally, material costs are less and erection is greatly simplified.

Maintenance expense is bound to be lower too. For one thing, fewer joints mean less chance of costly leaks. And there are no threads to invite corrosion.

ARMCO Pipe is available in various diameters from 6 to 36 inches, wall thicknesses from 7/64 to ½-inch, with optional coatings and base metals. Why not consider its use on that next job? Just mail your plans and specifications to The American Rolling Mill Company, Pipe Sales Division, 1041 Curtis Street, Middletown, Ohio.

ARMCO Armco

SPIRAL WELDED PIPE

Delaware TAPPI Discusses Calenders

The Delaware Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club, Philadelphia on Friday, April 12th. W. O. Wheeler of the Wheeler Calender Roll Company gave a talk on "Calenders and Calender Rolls" in which he outlined a theory on what takes place in the calendering operation in the development of transparency and paper finish.

Roger Egan, Chairman of the Eastern Arrangements Committee of the TAPPI Fall Meeting (Aug. 21-23, 1940 at Seattle, Wash.) Committee showed moving pictures of incidents relative to the 1934 fall meeting at Portland, Ore.

J. F. Halladay, F. J. McAndrews and J. Roslund were appointed to serve as a committee to make arrangements for the annual June dance of the Section.

Among those present were the following: H. J. Farra, F. E. Winslow, Alex. McInnes, Jr., Harry Hulmes, R. H. Dillingin, Elliot J. Stokes, Samuel M. Bratton, A. E. Waugle, John Roslund, F. J. McAndrews, Leslie Justice, J. N. Tuttle, Frank Greek, John F. Boyce, J. F. Ohlson, Samuel Hagner, M. Leichliter, Jasper Purcell, O. C. Codes, A. Plinohel, J. F. Good, J. M. Booth, George Oechsle, Joseph Fischer, Elwood H. Koonty, A. F. Pittoff, Wm. Oulanhell, A. S. Hall, J. C. Harper, Jr., H. F. Hoffman, Almeron W. Wickham, Lewis B. Miller, A. W. Cooper, R. H. Macanley, M. Craig Maxwell, Howard H. Street, A. H. Nadelmann, Roger Egan, J. D. Davis, W. O. Wheeler, C. M. Connor, Lois Hans, G. L. Schwartz, J. M. Chestnutt, J. L. Grauel, George Suydam, Alan R. Boyd, Loy Bixler, R. Tutt, Jr., J. R. Atwater, Thomas P. Field, Ward Harrison, C. W. Hoffman, R. deS. Couch, and Chas. W. Cassell.

To Open Paper Bids May 20

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 17, 1940—Unless something unforeseen develops, the Joint Congressional Committee on Printing will open bids for a six months supply of paper on May 20 for use of the Government Printing Office, effective July 1 next. Awards will be announced on May 27.

The Paper Specifications Committee of the Joint Congressional Committee is recommending that in the future all bids made by paper concerns on combination lots are to be rejected. Specifications Committee is also recommending that in the future the size of paper sheets are to be larger. Also increased durability is to be demanded of calendar tag board.

Potdevin Wins Modern Packaging Award

Potdevin Machine Company, won a certificate of award in the Ninth All-America Package Competition for its part in producing the best package for the year 1939. Potdevin gluing machines are used by the Buffalo Springs Distilling Company, the producers of the winning package, for labeling their products.

Thousands of entries are made each year in this competition sponsored by the *Modern Packaging Magazine*. The All-America award is considered to be the highest and most valuable packaging honor which can be attained. Potdevin Machine Company, is located at 1223 38th Street, Brooklyn, N. Y.

March Newsprint Production

Production of newsprint in Canada during March 1940 amounted to 251,279 tons and shipments to 235,304 tons, according to the News Print Service Bureau. Production in the United States was 85,143 tons and shipments 86,930 tons, making a total United States and Canadian newsprint production of 336,422 tons and shipments of 322,234 tons. During March, 19,527 tons of newsprint were made in Newfoundland, so that the total North American production for the month amounted to 355,949 tons. Total production in March 1939 was 325,386 tons.

The Canadian mills produced 104,473 tons more in the first three months of 1940 than in the first three months of 1939, which was an increase of sixteen and six-tenths per cent. The output in the United States was 22,663 tons or nine and nine-tenths per cent more than in the first three months of 1939, in Newfoundland production was 11,035 tons or fifteen and nine-tenths per cent more, making a total increase of 138,171 tons, or fourteen and nine-tenths per cent more than in the first three months of 1939.

Stocks of newsprint paper at the end of March were 212,737 tons at Canadian mills and 15,815 tons at United States mills, making a combined total of 228,552 tons compared with 214,364 tons on February 29, 1940, and 226,047 tons at the end of March 1939. During the winter some tonnage was accumulated at points from which water shipments will later be made.

Paper Box Industry Improves

Sales and profits for last year in the paper box industry, while still below 1937 peaks, were "considerably" improved over 1938, according to a special study of the industry released last week by Dun & Bradstreet, Inc. Although manufacturers' sales, at $360,600,000 in 1939, were 12 per cent below the 1937 figure, the industry was inclined to find more of an encouraging nature in the general picture than had been evident two years earlier, Dun's stated.

Foremost reason for optimism, according to the report, was found in a comparison of tonnage figures. Estimated output of paper board was 5,910,000 tons last year, compared with a previous high of 5,510,000 in 1937. Furthermore, shipments of solid fiber and corrugated containers, which represent a substantial portion of total box output, amounted to 31,856,000,000 square feet, against 30,035,000,000 in 1937, the survey showed.

Robertson Box Co. Holds Party

The Robertson Paper Box Company held its third mid-winter party at the Y.M.C.A. New London, Conn. March 30 and as usual a very enjoyable time was had by all in attendance. The winners for the various events were as follows:

Women's Bowling—married, 1st—Alta Marsh, 2nd—Mary Schwartz.

Women's Bowling—single, 1st—Catherine Belanger, 2nd—Elizabeth Boska.

Consolation—Mary Stankowich.

Men's Bowling—married, 1st—Harry Schwartz, 2nd—Arthur Paradise.

Men's Bowling—single, 1st—Stanley Kobelski, 2nd—Carl Fox.

Consolation—George Staubley.

To Manage Dexter

Due to the recent death of Francis J. Dooley, sulphite mill manager, of the Dexter Sulphite Pulp and Paper Company; the receivers of the company, W. E. McIntyre and B. C. Foster, working in conjunction with A. R. Cornwall, attorney for the company, have deemed it necessary to reorganize the management.

As a result of the re-organization George H. Schell, formerly superintendent of the Bayless Pulp and Paper Company, Austin, Pa., more recently superintendent of the Frontenac Paper Mill of the Dexter Sulphite Pulp and Paper Company, was appointed general superintendent.

A. W. Ayles, chief chemist and member of the Technical Association of the Pulp and Paper Industry, who for the past eight years has been on the technical staff at Dexter, was appointed assistant to the general superintendent and the sulphite superintendent.

C. W. Hayes, who has worked for the Dexter company for the past fifteen years in several supervisory positions and more recently as Mr. Dooley's assistant is retained as sulphite superintendent.

In Mr. Schell, the receivers and their attorney feel that they have a man excellently qualified for the position due to the wide experience which he has had in various pulp and paper mills in the United States.

Carter Rice Meet

BOSTON, Mass., April 15, 1940—A second sales meeting of Carter Rice & Co., Corporation was held recently to complete the work regarding the price structure and formation of the new price book. There was a full attendance with Sales Manager Frank H. Winter presiding.

This new Carter-Rice Loose-Leaf Price Book contains rates of the following lines: writings and safetys, bonds, manifolds and onion skins, mimeographs and duplicates, ledgers, covers, blottings, books, D. E. books, envelopes, business announcements, wedding announcements, blanks, R. R. tough check, bristols, gummed and plate papers, tag stock, wrapping and twine, and manufacturing and trade customs.

General information includes terms, variations, claims, returned goods, and quotations. The prices for the entire book are placed on 33 heavier index bristol guide tabs. For ready reference are listed all the papers carried in stock by Carter Rice & Co., which follow on the subsequent bristol guide cards.

Two thousand of these price lists are being distributed by the Carter Rice salesmen, so that all one has to do is to place the loose-leaf book in the binder which the customer already possesses.

p&h ELECTRIC CRANES
FOR PAPER HANDLING

America's Largest and Only Crane Builders Producing Complete Electrical Crane Equipment

The photo above shows how P&H paper handling cranes enable you to increase storage capacity by piling rolls higher. Smooth handling, without bouncing and jouncing rolls, cuts damage to an absolute minimum. There's less handling required; it's done faster, at much lower cost. Here, one man does the whole job of storing and rehandling.

You can count on P&H crane engineers to solve your problems also in the most efficient and economical manner. Call in a P&H engineer. Or write us for literature.

General Offices: **4560 W. National Avenue, Milwaukee, Wisconsin**

HARNISCHFEGER CORPORATION
ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

Spend Vacations in Bermuda

BOSTON, Mass., April 15, 1940—John H. Brewer, vice-president and general manager of Storrs & Bement Company, is passing three weeks in Bermuda, expecting to return about April 23.

J. Mason Lincoln, promotion manager of Storrs & Bement Co., and Mrs. Lincoln, who were recently married are passing their honeymoon in Bermuda.

PAPER
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Henry J. Berger
EDITOR

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COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Olympic Hotel, Seattle, Wash., August 20-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio. June 18-20.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

PULP AND PAPER SITUATION

It is difficult to appraise the wood pulp situation at this date because of the uncertainty of the tonnage of pulp that Scandinavian countries may be able to ship to this country in the future. The outlook is obscured by the possibility that hostilities in the northern countries may compel the great pulp industry in Sweden to greatly curtail if not entirely stop for an uncertain period its production and shipments to the United States. The foreign wood pulp situation is critical but the greatest anxiety is expressed for the future rather than for the present. At this date, well informed opinion takes the view that pulp stocks are adequate for the present, that there is no factual basis for alarm, and that grave concern is directed to the future which, dependent upon the conflict in northern waters is now unpredictable.

Although no figures are now available showing mill stocks of pulp on hand, it is reported on good authority that pulp inventories are ample for the present. It is known that some mills have very large supplies of pulp in storage, while others are doubtless much less favorably situated. A figure showing the total tonnage on hand would appear to be of little value and it would be necessary to have individual mill reports of pulp stocks on hand and know the percentage of pulp supply to pulp needs to arrive at an accurate evaluation of this phase of the current pulp situation.

Speaking in general terms applicable to the whole industry, there has been a shortage of some grades of pulp for several months. The higher grades of unbleached sulphite have been relatively scarce for sometime and kraft has not been plentiful. In the weekly review of markets published in the PAPER TRADE JOURNAL it was remarked months ago that the supply of prime quality pulp was growing scarce. Comment in the month of January said in part: "Prices on all kinds of chemical pulp are very firm and prime qualities are reported scarce."

Production of all grades of pulp by domestic mills in 1939 was 7,107,000 tons, compared with 5,975,000 tons for 1938, with 6,572,918 tons for 1937, and with 5,695,219 tons for 1936. Domestic production of the six paper making grades of pulp for December 1939, totaled 598,963 tons; for January 1940, 630,160 tons; output for February 1940 totaled 572,331 tons. Stocks on hand at the end of February at domestic mills totaled 127,294 tons.

Imports of wood pulp for December 1939 totaled 203,700 tons; for January 1940, 240,100 tons, and for February 1940, 142,800 tons. Imports from Sweden for December 1939 totaled 87,500 tons; Finland, 43,500 tons, and Norway, 10,000 tons. Imports from Sweden for January 1940 totaled 137,400 tons; Finland 40,800 tons; and Norway 10,200 tons. Imports from Sweden for February 1940 totaled 78,800 tons; Finland, 11,200 tons, and Norway, 6,100 tons.

The situation in paper is based upon the pulp situation. The first quarter of 1940, according to a leading authority, was a period of readjustment, with orders below production since the peak in October of last year. The high level of production attained last year is attributed to forward buying in anticipation of inflation of prices due to the conflict in Europe or shortages of paper. Price increases were moderate and scarcely adequate to meet the increases in production costs. Since last October, production has been running ahead of orders. Paper production for February 1940 was a little below that of the preceding month but higher than any previous February except 1937. The production ratio of domestic mills for the first two months of the current year was 8.8 per cent higher than for the first two months of last year. Orders received in February were 3.6 per cent below the preceding month but 4.6 per cent higher than for February, 1939.

The critical situation in foreign pulp encourages the expectation that pulp will become scarce and prices will advance under the normal operation of the law of supply and demand. This result will exert pressure on paper prices which are relatively low, thus affording an opportunity for forward buying in anticipation of higher prices and shortages in the future. We appear to have entered the first phase of the upswing and forward buying may be expected to begin at a moderate pace. The initial movement is denoted by the withdrawal of current price lists by some paper manufacturers but any general advance in paper

prices at this date is generally viewed in the industry as premature and unwise.

It is interesting to recall that in 1937, domestic paper mills consumed 8,665,000 tons of wood pulp, of which 2,395,000 tons were imported from Canada and Europe; the imports from Europe aggregated 1,637,000 tons. The dependence of the domestic paper industry on foreign pulp has increased from 15 per cent in 1917 to 24 per cent at the present time, or about 1,331,000 tons a year. Great Britain imported 2,011,000 tons of wood pulp in 1937 and France 731,000 tons. It has been pointed out that if the supply of Scandinavian pulp is sharply curtailed, Canada may increase shipments to Great Britain and France. In December 1939 Canada exported 50,800 tons of pulp to the United States; for January 1940, 48,700 tons, and for February 1940, 45,200 tons. Total Canadian exports of wood pulp reached a high of 680,000 tons in 1937, 78 per cent of which came to this country.

There is a possibility, it has been pointed out, that a shift in the sources of world supply of wood pulp may occur if shipments from Scandinavian countries are very greatly curtailed and if this should occur it would be likely to stimulate production in this country as well as in Canada, and mark the beginning of a trend to expand our domestic pulp industry to more fully meet our total pulp requirements. The higher producing costs in this country would tend to check this expansion and as labor costs are about 50 per cent lower in Scandinavian countries, the possibility of replacing Scandinavian pulp appears remote. But in view of the difficulty Scandinavian countries are experiencing in making shipments and in obtaining coal, hostilities in the northern areas exert a powerful force to advance pulp and paper prices.

Steering Committee Appointed

Development of the Certification Program of the N.P.T.A. as announced recently according to R. H. Ziegler is progressing as rapidly as consistent with due attention to the problems arising in such an ambitious undertaking. Care must be exercised in all steps of the procedure to be sure of anticipating problems likely to arise and maintaining the fundamental principles to be observed.

The National Certification Board, which will serve as the Steering Committee behind this program, has been appointed by C. E. Roach, vice-president in charge of the Wrapping Division, with F. T. Jamison, Interstate Cordage and Paper Company, as chairman, and including G. E. Carpenter, Carpenter Paper Company, Omaha, C. H. Maurinus, the Alling & Cory Company, Rochester, E. W. Wesselmann, the Diem & Wing Paper Company, Cincinnati, A. H. Stein, Yorkville Paper Company, New York City, L. S. Pollock, Pollock Paper and Box Company, Dallas, and J. F. Blackman, D. F. Munroe Company, Boston. The initial meeting of the board will be held soon.

The testing laboratory has been selected and it is expected that the first group of paper products will be offered for certification within the next few weeks.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.6%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.5%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.1%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	.....	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	.....	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	.....	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	.....	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 14 weeks	87.0%	81.5%	67.5%	90.4%	77.3%	68.7%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
March 2	83.8%	March 4	83.5%
March 9	83.5%	March 11	84.2%
March 16	84.7%	March 18	82.3%
March 23	85.1%	March 25	84.1%
March 30	83.1%	April 1	86.2%
*April 6	80.5%	April 8	83.7%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Mar. 2, 1940	Mar. 9, 1940	Mar. 16, 1940	Mar. 23, 1940	Mar. 30, 1940	Apr. 6, 1940
0% to 50%	54	63	59	53	48	48
51% to 100%	244	235	235	238	232	151
Total Mills Reporting	298	298	294	291	280	199

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	....	....	....	....

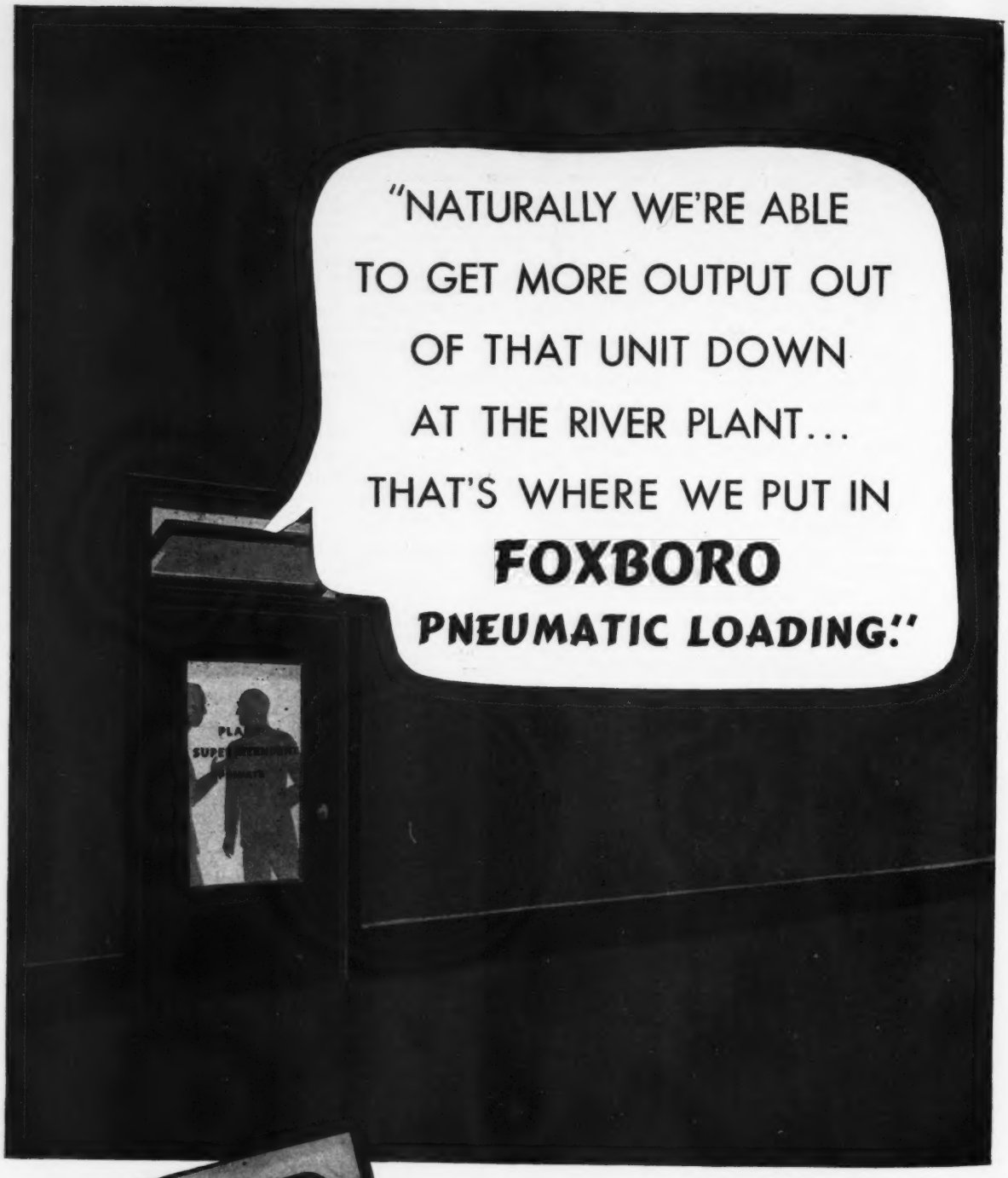
Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	....	....	....	....	....	....

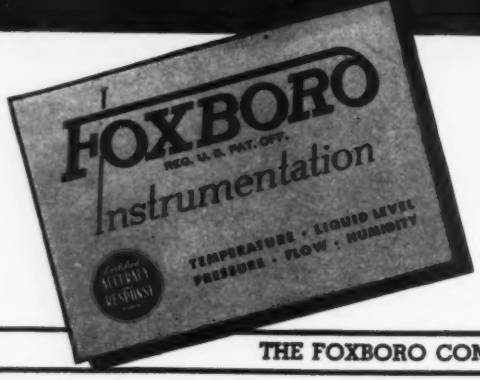
Week end. Mar. 2, 1940—69%
Week end. Mar. 9, 1940—69%
Week end. Mar. 16, 1940—70%
Week end. Mar. 23, 1940—70%
Week end. Mar. 30, 1940—67%
Week end. Apr. 6, 1940—68%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.
* Preliminary figure.

Eastern Tablet Co. Builds

ALBANY, N. Y., April 15, 1940—Plans are under way by the Eastern Tablet Company for the construction of a new addition to its plant which will eventually be used in housing the Sherman Envelope Company, of Worcester, Mass. The Thomas Mulcare Corporation, of Boston, has the contract which calls for an expenditure of about $30,000. The new structure will be 66 by 100 feet, two stories high, and will provide about 13,000 square feet of space. The addition will be of reinforced concrete and steel. Removal of the Worcester concern to this city has been under consideration for some time and the change was decided on as better for the conduct of the business. The new concern is expected to take occupancy of the new plant early in the fall and will employ about 150 persons. The present building of the Eastern Tablet Company is 400 by 200 feet with excellent spur track facilities.





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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Significance of Bacterial Control in Paper*

By C. M. Baker[1]

Abstract

Bacterial control is an index of good housekeeping and it is desirable from the viewpoint of plant operation. Bacterial control, however, is not essential for the elimination of public health hazards because none exist. No case of a communicable disease has been traced to contamination of the paper or paperboard, from which a food container was made although billions of such containers have been used. Pathogenic types of organisms are not present in the finished paper or paperboard as it leaves the paper machine due to the high temperature of the driers.

Any reference to bacteria conveys to the lay mind the idea of disease. Even health officials who are trained to distinguish between the significance of different tyes of bacteria become apprehensive when the bacterial content of a product is mentioned, particularly where it has any association with foods.

The presentation of the subject of the bacterial content of paper and paperboard has been such as to develop apprehension, if not real concern, on the part of the public and of health officials, that the use of paper containers constitutes a real public health hazard. The following is quoted from a communication or regulation regarding Containers for Frozen Desserts issued by the health department of one of our large cities:

> "The researches . . . . have disclosed the existence of regrettable and unnecessary conditions of insanitation in the manufacture of such (milk) containers. The use of water from grossly polluted sources without bacteriological control in paperboard factories has been especially disturbing. Some manufacturers have used reclaimed paper stock. Generally speaking, there has been a notable lack of adequate bacteriological control in the manufacture of paperboard containers for food."

There is no foundation in fact for such a conclusion which practically condemns the paper container. Tanner, Sanborn, and others have stated that bacteria contained in paperboard have no public health significance.

In a paper before the 1939 convention of the American Public Health Association, F. W. Tanner, in referring to the use of inferior grades of paper for dry foods, stated: "They are, however, satisfactory bacteriologically since no pathogen can survive the processes involved in papermaking."

There is no case on record, where communicable disease has been traced to the contamination of paper from which food containers have been made, although millions of such containers have been used. Certainly if any health hazard were involved it would have been apparent long ago.

Comparison of Milk and Paper

Since milk is a most susceptible food to contamination and in view of the present development of paper containers for milk, let us draw a comparison between milk, the food; and paper, the container.

Origin of Milk

Milk originates from animals, which themselves may be a source of disease in humans. It is produced in the barn, where the control of sanitation is extremely difficult. Although rigid regulations are in force, and careful inspection is maintained of dairies supplying milk to large cities, there remains, nevertheless, a definite health hazard.

Although the milking may be done by machines which are carefully disinfected or sterilized after use, the udders are usually finally stripped by hand, so that there is danger of personal contamination of the milk from typhoid or other disease carriers. Furthermore, milk is a medium which will retain many classes of bacteria including pathogens for a considerable length of time.

Origin of Paper

The pulp, from which the paper container is made, originates from wood. In all chemical pulping processes the wood goes through a process which definitely sterilizes and removes all bacteria. There is a minimum of personal contact in the pulping process. Furthermore, the pulp is usually handled in a dry state or a condition not conducive to the retention of pathogenic types of organisms.

Even though reused paper is contained in the stock furnish, this paper has usually been maintained in a dry condition, so that there has been little opportunity for pathogenic types of organisms to remain in it, even though it might have been contaminated.

Finally the paper or paper stock is mixed with water before it goes to the paper machine. Most mills have water supplies comparable with municipal drinking supplies. The water is either treated in modern purification plants or is secured from ground water sources. To give the milk the benefit of the doubt, however, let's assume that the mill water supply is not up to standard.

It may be assumed that up to this point the milk, as it leaves the barn, and the paper—with inferior water in the mill—as it leaves the wet end of the machine, are on a par.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Member TAPPI, Consulting Engineer, Madison, Wis.

Protection of Milk

The most rigid regulations and requirements regarding dairies and the handling of milk are dependent on the personal factor. Such protection invariably breaks down to a greater or less extent.

To minimize the danger from the raw milk most of the milk delivered in the larger cities is pasteurized. The Milk Ordinance and Code recommended by the U. S. Public Health Service for 1939 provides that:

> "The term 'pasteurization', 'pasteurized', and similar terms shall be taken to refer to the process of heating every particle of milk or milk products to at least 143 deg. F., and holding at such temperature for at least 30 min., or to at least 160 deg. F., and holding at such temperature for at least 15 min., in approved and properly operated equipment."

Protection of Paper

From the wet end of the paper machine the paper web passes over a series of drying rolls which are steam heated to a temperature of 230 to 280 deg. F. the usual temperature running about 260 degrees. The time required to pass over the driers is usually about 3 minutes. The heat produces steam in driving the water from the paper. Compare this treatment with that for pasteurization of milk at 143 and 160 deg. F. the temperature for the paper is 100 deg. F. or more higher. Furthermore, no personal factor is involved, because paper is not made, unless the temperature is maintained, while if there are defects in the pasteurizing equipment in connection with the milk, the milk may still pass through and go to the consumer.

Pathogenic types of organisms do not survive the driers on the paper machine. Tanner, in the paper previously referred to, mentioned tests that have been made with the application of cultures of pathogenic types of bacteria on the wet sheet before it passes over the driers, and analyses for the same classes of bacteria after the sheet is passed over the driers. In all cases it has been impossible to detect the presence of any of the pathogenic organisms in the final sheet. It is necessary, however, that pure water be used on the calender rolls or other points at the end of the driers, to be sure of retaining the germicidal efficiency of the driers.

We now have the finished product, the milk ready for the market, and the paperboard ready for making into the container. The code of the U. S. Public Health Service limits the bacterial content of paper used in making milk containers or milk bottle caps to 250 per gram. The same specifications, however, permit up to 30,000 bacteria per cc. in pasteurized Grade A milk.

A paper milk bottle will weigh about 50 g. thus permitting a total bacterial content in the container of 12,500. The quart of milk, however, may contain 28,380,000 bacteria, 2260 times as many as are permitted in the paper container.

The above analogy, however, is unfair to the paper, because it would hold only in case the container were ground up and mixed with the milk, while in fact the milk only comes in contact with the surface of the paper which is protected and sterilized with a hot coating of paraffin.

Disease Hazard From Milk

Outbreaks of milk borne disease as indicated by records published by the U. S. Public Health Service for 1937, the last complete record the writer has available, show:

Typhoid Fever: 15 outbreaks; maximum cases, 125; total, 162.
Scarlet Fever: 11 outbreaks, maximum cases, 93; total, 324.
Scarlet Fever and Septic Throat: 1 outbreak; 645 cases.
Septic Sore Throat: 2 outbreaks; maximum cases, 250+; total, 350+.
Food Poisoning: 10 outbreaks; maximum cases, 300; total, 435.
Gastro-Enteritis: 2 outbreaks; maximum cases, 75; total, 88.
Diarrhea: 2 outbreaks; maximum cases, 24; total, 35.

As previously stated, no case of communicable disease has been traced to the contamination of paper from which milk or other food containers have been made.

Comparison with Water

A somewhat similar parallel may be drawn with public water supplies. Many large cities secure their public water supplies from polluted sources, the city of Cincinnati, Ohio is an example. This water passes through water purification plants consisting of filtration and sterilization usually with chlorine.

The operation of the water purification plant is dependent for efficiency to a considerable extent upon the personal factor. Unless the filters are kept in proper condition and washed efficiently at the proper time, and unless the chlorine apparatus is maintained in perfect operation at all times, water may pass through which carries pathogenic types of organisms. In other words, in water purification, as in the pasteurization of milk, the personal equation is an important factor.

Unless the driers are operating at practically full temperature paper is not made, so the personal factor in the sterilizing efficiency of driers on a paper machine is eliminated.

Even though the water is delivered from the purification plant in a sanitary condition, it may become contaminated in its distribution, as for instance the amoebic dysentery outbreak which developed in certain hotels in Chicago during the time of the World's Fair. In this instance the water system in the hotels was contaminated because of faulty plumbing fixtures. Likewise milk may be contaminated in its distribution, even though sanitary containers are provided.

Paper vs. Glass Milk Bottles

Although it has been the intent to confine this discussion to the manufacture of the paper rather than the conversion of the paper into the ultimate container, the story would not be complete without comparison of the bacterial condition of single use paper containers and the reused glass bottles.

Bacterial Count in Glass Bottles

One needs but to look about his own mill, or even about his own home, to observe the insanitary uses often made of glass milk bottles. These bottles are returned to the dairy, and although they are washed and sterilized under carefully controlled conditions, there ever remains the personal factor. The temperature may not be high enough, the concentration of the chemicals may not be strong enough for complete sterilization. The personal factor here is very important. As previously pointed out, however, the personal factor is eliminated on the drying rolls of the paper machine.

A report *(1)* of the Joint Committee of the Public Health Engineering Section of the American Public Health Association and the Conference of State Sanitary Engineers in 1934 contains data regarding the bacterial content of unwashed and washed glass bottles. Here it is necessary to revert to the astronomical figures of our national debt, with a billion as the unit, to comprehend the results. The maximum bac-

terial count showed 2,300 billion per quart bottle of 107 bottles examined, the minimum, 25 billion, and average of 320 billion. The best method of washing left a maximum of 5.6 million, a minimum of 40,000 and an average of 1.6 million. The washing, however, did not include the chlorine rinse.

Layson, Huffer, and Brannon *(2)* conducted tests with 454 bottles from plants in different sections of the country with more efficient washing. They state:

> "The unevenness in the bacterial count of bottles was very noticeable. In any case of 12 bottles there might be two or three sterile ones while some of the others might contain as many as 180,000 to 200,000 bacteria per bottle. In three plants bottles were found which were uniformly low, the count being below 1,000 bacteria per bottle. In the rest of the plants, some of the bottles contained less than 1,000 bacteria per bottle, while others contained hundreds of thousands, and the rest of the counts were between these extremes."

Bacterial Count in Paper Bottles and Paper Food Containers

Similar tests with paper containers have shown nearly 90 per cent with no bacterial count and an average of only 2 or 3 per container for the remainder.

Total bacterial count of paper used for food containers is without significance from the public health standpoint. Mere numbers of bacteria have no health significance. Total counts used to be made in connection with the control of public water supplies. This test has now been abandoned, however, and dependence placed wholly upon the determination of the presence of pathogenic types of organisms.

Wherein then lies the significance of bacterial control in paper and paperboard?

Bacterial Control in the Mill

Under parallel conditions the total count may furnish somewhat of an index regarding cleanliness or housekeeping in the mill. It may also be used as an index in connection with slime control. This, however, is no new development.

Bacteriological studies were made regarding slime and slime control by Fritz *(3)* and Beckwith *(4)* in 1931. During the summer of 1931 the writer conducted rather extensive investigations with bacteriological control regarding the use of ammonia and chlorine for slime control in paper mills. The results of this investigation were published in a bulletin by the American Paper & Pulp Association in 1931.

In this work, and in connection with work in numerous mills since, total bacteriological counts, principally of the white waters, have been used as a comparative index regarding the slime control properties of different setups of sterilization in pulp and paper mills.

Since this work the Wallace & Tiernan Co. and others have conducted considerable research regarding identification of typical slime organisms. In one mill on the Pacific Coast the writer assisted in developing bacteriological studies which resulted in an entirely different setup for slime control. Initially chloramine solution was used. The bacterial data indicated that better results could be secured by the separate application of ammonia and chlorine because proper relation between the two chemicals and mill conditions could be correlated so as to get the best results. It is understood that finally slime cultures on special media were used as a control index.

Lack of Standard Technique

Notwithstanding the fact that standards of the U. S. Public Health Service require a maximum count of 250 bacteria per g. in paperboard used for milk containers and milk bottle caps, this standard is not coupled with any standard method or technique in analyses. Different mills are using various methods and technique. Under such conditions comparable results cannot be secured. The precise technique is relatively unimportant so long as it is uniform and the same in all cases. The adoption of standard procedure and technique is imperative if comparable results are to be secured. The Technical Association of the Pulp and Paper Industry could render an excellent service in developing such a procedure.

Conclusions

It is believed that the facts warrant the following conclusions:

There is no health hazard in the use of paper for food containers. In fact, paper constitutes a sanitary and safe material for this purpose

The total number of bacteria present in the papers from which food containers are made is without significance from the standpoint of public health.

The total bacterial content of the paper may constitute somewhat of an index of the general housekeeping of the mill and, from the esthetic standpoint, may be a matter of interest to public health officials.

Bacterial control in the mill may furnish an index and guide regarding proper methods of slime control to provide for more efficient and better operation. This is particularly important in connection with the development of recirculation and reuse of waste water in the mill.

In view of the standard which has been adopted by the U. S. Public Health Service for a maximum of 250 bacteria per g. of paper used for milk containers or milk bottle caps, it is believed that every mill manufacturing such paper should provide for continuous bacteriological control in their mill when manufacturing such papers.

Standard methods for procedure and technique must be adopted and followed, if reliable and comparable results are to be secured.

In view of the interest that has been developed in this subject because of agitation in the past few years, it is possible that further bacterial requirements will be made upon the industry for paper to be used in food containers. It appears, therefore, that bacterial control is with us regardless of significance with reference to the public health, but let us emphasize that the use of paper containers is a protection to the public health, and in no way constitutes a hazard.

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Corrosion Resisting Alloy Lined Vessels in the Paper Industry*

By Merrill A. Scheil[1]

Abstract

This paper summarizes the testing procedure used as a basis for selecting corrosion resisting alloys which will give reliable and successful service after fabrication into alloy lined vessels for the various applications in the pulp and paper industry.

The fabrication and metallurgical variables that must be embodied in a program of specimens for such testing in order to obtain an accurate picture of the corrosion requirements are discussed. Such fabrication factors as heat treatment, welding, forming, surface finish, and susceptibility to stress, also any particular service variables peculiar to the individual service are shown to be pertinent to the successful application of alloy for process equipment.

As a result of following this testing technique in a number of instances, process equipment such as digesters, SO_2 cooling towers, liquor heating and storage tanks have been successfully alloy lined and are reported to be giving satisfactory service. Among others, a large field erected, lined storage tank is described, and the alloy selected for this service is shown to be the direct result of the program of corrosion testing.

Corrosion resisting alloys have been available quite a few years, yet there have been several unexplained phenomena in connection with their use that have resulted in many applications which proved unsatisfactory. In recent years, however, improvements have been made in the manufacture of these alloys and in methods of using them. We still have not reached the point, where it is safe to use, say, an austenitic alloy for lining merely on the strength of satisfactory performance in some other applications. Recognizing this fact, we have adopted a procedure of testing for each new application which enables us to make reliable use of many of these alloys and to successfully fabricate them into required equipment.

No doubt there are many in this audience who have had sad experiences in the past with stainless alloy equipment. They expected it to be the universal metal—a panacea. After trying out these alloys and experiencing spotty results, many engineers became skeptical of them and gave up the idea, going back to their old equipment. Similar experiences in various industries slowed down the application of corrosion resisting alloys and gave them a reputation for being unreliable and tricky to handle.

Getting into this field ourselves years ago, we also had our share of disappointments—experiences that at the time could not be explained. We then resolved to make a thorough study of these alloys and to find out how to handle them successfully for application in chemical services. Our experience up to that time had been mainly in the fabrication of corrosion resisting lined pressure vessels for the petroleum industry. This experience proved to be exceedingly valuable as a background for our adventure into the more highly corrosive services.

Field Service Experience

Our corrosion testing of the austenitic stainless alloys taught us that it was practically impossible to ever duplicate the customer's service conditions in our own plant. Furthermore, that it was impractical for the customer to try to duplicate our fabrication treatments on samples or in pilot plant tests that he himself might be making. Because of the failure of users to recognize this important fact when testing alloy samples for corrosion, their carefully conducted tests had little significance. In other words they had disappointing experiences, because their tests did not take into consideration the effect of fabricators' operations.

There are many requirements for the fabrication of alloy lined vessels that may be harmful to the corrosion resistance of these alloys, if they are not properly selected and handled. As a result of our years of experimentation with alloys, both in laboratory corriosion testing and in field service corrosion testing, we have learned to recognize certain material characteristics resulting from the fabrication processes. While it is not always possible to correlate the corrosion behavior with the metallurgical characteristics such as grain size, chemical analysis, heat treatment, etc., we have found the solution to many of our problems in the proper selection of materials.

At first thought this would seem to be a very time consuming method, since it would be necessary to either have on hand a large enough stock of corrosion resisting alloy materials from which to take tests or else to order alloy plates for each application and hold them until the field service tests had shown that the fabricated test samples of the same material were satisfactory. The material requirements for each application of a solid alloy or lined vessel usually vary to such a degree, that it is not possible to keep enough of these materials in stock for individual check service tests. However, our long experience with a wide range of alloys makes it possible for us to choose alloys for service testing which exhibit differences in corrosion behavior thus giving our actual testing technique the latitude, which we feel is required.

We have samples available from several hundred heats of corrosion resisting alloys from every manufacturer that provides such alloys. All of these have been investigated with regard to their corrosion characteristics by laboratory corrosion tests after the application of various fabrication treatments, and many have been placed out in the field under actual operating service conditions. From these tests we have gradually built up a bank of corrosion information which has enabled us to correlate our fabrication treatments upon corrosion resisting alloys with laboratory and field service tests. Furthermore, the con-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Research Metallurgist, A. O. Smith Corporation, Milwaukee, Wis.

sistent results and experience obtained from this program of corrosion testing enables us to select materials upon short notice for a specific application after field service tests have been made.

Procedure Followed to Solve Specific Problem

For example, a customer comes to us with a serious corrosion problem on his hands. It may be a new process which he has developed, or it may be a refinement which he desires to make upon an old existing process. His engineers, metallurgists, and chemists may tell him, that they have experimented with all of the corrosion resisting alloys in this process, and that certain alloys are to be preferred, then again he may not have conducted any researches of his own. In either case he is usually reluctant to describe his process except in a very general sort of way but is quite willing to accept samples for service testing in existing equipment or in pilot testing equipment.

There may be several methods of protecting this customer's vessel against corrosion, but these all depend upon the corrosion environment, and on this as just mentioned only scant information is generally available. After our engineers have studied the customer's requirements and made up a preliminary design of the structure for the contemplated service, we lay out a program of corrosion tests which will incorporate all the steps in fabrication upon the various types of corrosion resisting alloys, which, it is anticipated, will combat the particular corrosion problem confronting this customer.

From the information supplied by the customer, together with our corrosion testing records upon hundreds of alloys, we then select materials, which will show variable corrosion behavior of the type of analysis we want to test. When fabricated, these represent a graded series showing which particular alloy is most resistant to this corrosion. For example, we will select a graded series of KA2SMo alloys all within a definite composition range but demonstrating different corrosion behavior when placed in the same condition by fabrication. In this graded series, one of the alloys has good corrosion characteristics, another medium characteristics, and still another poor characteristics. These three alloys may all be perfectly equal with respect to their corrosion behavior when in the fully annealed or quenched condition, but it must be recognized that many times this condition is not possible to meet or produce in the fabricated vessel.

After we have selected the alloys to be service tested, we perform welding operations on them and heat treatments in accordance with the program outlined to cover the construction of the customer's vessel. We have used as high as 29 separate fabrication treatments to study the effect of corrosion for a possible application of our methods of construction. This will give you some idea of the complexity of the fabricator's problem and emphasizes the difficulties confronting those who attempt to make tests of their own without full knowledge of the fabrication requirements.

The metallurgist must give proper consideration to the surface finish also, because it plays a big part in the ultimate solution of many of the present day corrosion problems. When corrosion tests are to be made on alloys which depend to a large extent upon their surface condition for their superior properties, this fact must be recognized and properly reproduced on the specimens submitted for field service testing. This introduces surface finish and passivation—two very important details that cannot be overlooked in the application of many of the corrosion resisting alloys.

When our corrosion test specimens have all been completed, we record the final weight, the thickness, and the surface area of each specimen. We also record all the fabrication treatments which are a duplication of the operations we contemplate upon the full-sized vessel. These corrosion test specimens are then given to the customer with recommendations on how to suspend them for testing. There are individual details that vary for every application, and we cooperate with the customer in trying to avoid a setup which will vitiate the results by poor judgment in the exposure or positioning of our specimens. In some cases we purposely supply specimens of a composition and arrangement which will offer the most satisfactory setup for electrolytic action, just to learn whether service conditions may be present to create this kind of corrosion. This is in line with our previously explained methods, whereby we introduce specimens which we know to be bad and easily corrodible and this gives us knowledge concerning the type and severity of the corrosion problem. Obviously, if we only included good samples of a high order of chemical resistance, we would not learn much about corrosion.

Full cooperation of the customer is, needless to say, required for the success of such a program of corrosion testing. We cannot be present during the testing in the customer's plant, and in most cases we do not have access to complete details of the production process to which our specimens were exposed. Of course, these details are not always necessary to arrive at conclusions on which to base the selection of the material most suitable for his equipment. The customer must realize, however, that this is his test, and that he must conduct it with all the experience at his command. His personnel must apply all their knowledge of past experience and possible future changes, so that the testing procedure will be broad enough to include all reasonable variations and changes in process. We all know that the raw materials can alter processes, and that unusual conditions may present themselves to increase the severity of the corrosion problem. These facts are known only to the customer, and a little foresight used during the testing period will, therefore, give added assurance that the alloy selected will perform satisfactorily under unusual service conditions.

It has been our practice to ask the customer to submit our test specimens to several periods of testing. This is quite important as there may be a more noticeable attack upon the alloy surfaces during the first period of contact with the service conditions. This can be referred to as the breaking-in period. Quite frequently the apparent attack on alloys is reduced in succeeding test exposures and tends to approach a more uniform corrosion rate figure during later test exposures. In some cases the alloys react with the products of the process and form a protective film of their own. When this happens we must study our specimens carefully and remove this deposit on some and not on others, to determine whether it is beneficial or detrimental. These periodic inspections during testing are observed by the research personnel either at our own laboratories or at the customer's plant. All observations are carefully recorded and weighings made of the individual

test specimens to determine the course of corrosion. At these periodic inspections we may remove from further testing certain of the alloys that are obviously failing. We expect this to happen in cases of severe corrosion, because we have included alloys with detrimental characteristics.

After the test specimens have been exposed to a sufficient number of operating cycles, duplicating service conditions, and the corrosion penetration rates have been determined over a number of periods, the specimens are cleaned to remove deposits or other extraneous surface material and weighed. The total weight loss is used to calculate the corrosion penetration rate in inches per year. In general, our practice is to avoid the use of corrosion resisting alloys for the lining of chemical equipment that show a greater corrosion penetration rate than 0.005 in. per year. In cases where there is severe local attack of the pitting type, this method is, of course, not applicable. The specimens are instead cross sectioned through pitted areas and measurements of the depth of corrosion determined. All specimens are carefully examined under a binocular microscope with at least 40 diam. magnification which is sufficient to reveal cracks or other surface defects. The weld metal deposits are carefully studied, and in many cases specimens are cross sectioned and microscopically examined to observe the structure of the alloys and welded joints. Records are then made and reports prepared for submitting to the customer. From our report, the customer then has information on which to choose the alloy he wishes to use.

As a result of our selection of a series of alloys, to which we have applied fabrication treatments, and on which the customer has conducted test exposures, we now have a much more complete knowledge of the alloy requirements. By this testing technique, the customer is enabled to select the type of alloy best suited for his service and we, as fabricators, have obtained the information to prepare specifications for the alloy, to use as a basis for the selection of the heats of this alloy and to properly fabricate the vessel for a successful service life. When our laboratory tests have proved the suitability of the alloy, we have assurance that the use of this material will be satisfactory for the intended service. Materials for electrodes to be used on the job are selected on the same basis and tested under controlled conditions. These tests completely cover all the alloy materials which will be subjected to the customer's service conditions.

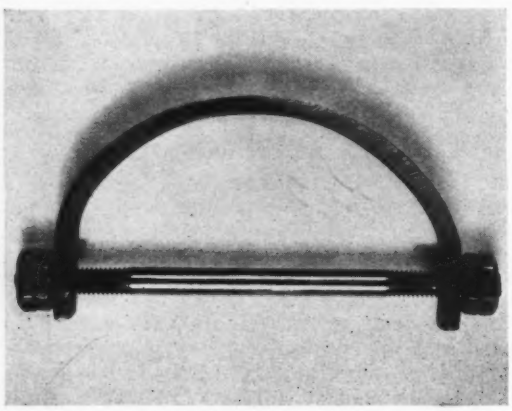

FIG. 1.
Example of a Horseshoe Specimen Used to Determine Corrosion Resisting Properties of Alloys. × 1.5.

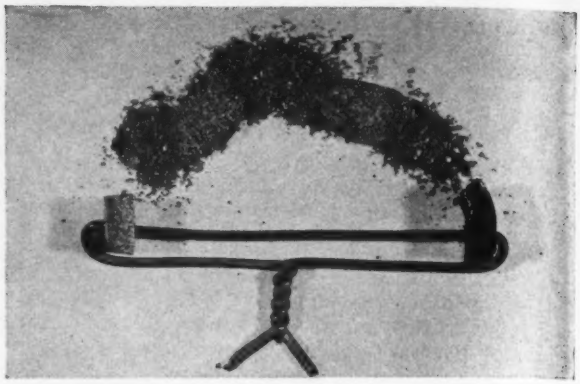

FIG. 2.
Completely Disintegrated Horseshoe Specimen of an Alloy Susceptible to Intergranular Attack. × 1.

Sulphite Digester Studies

About 10 years ago we constructed some small alloy lined digesters for large-scale laboratory operations. This equipment has been perfectly serviceable, although the attack on the lining was such that it did not encourage us to go into commercial application until the answers to several problems were found. It was the study of the material in these vessels, which led to our present knowledge of the effect of stress on corrosion resisting alloys. Our studies of corrosion cracking in austenitic stainless alloys, resulting from stress during corrosion testing and while under service conditions, are described in detail in an earlier paper by Hoyt and Scheil *(1)*. Therefore, this matter will not be discussed here except to draw some conclusions from this work and from work of a more recent date.

This article *(1)* dealt with the case of a corrosion resisting alloy manway neck which developed cracks during the initial period of service in a digester charged with sulphite liquor. The failure was due entirely to stress-corrosion cracking, and the alloy showed absolutely no signs of a general corrosion attack. This type of failure was so entirely different from anything we had experienced before, that we made a complete study of it in our laboratory and developed a test that would reproduce the service failure on the same alloy in 1½ hr. time. Our laboratory investigations showed that strain or cold working as well as elastic stress was necessary to produce stress-corrosion cracks in this alloy, when it was in a susceptible structural condition. Our tests with different elastic stresses did not suggest, however, that a critical stress was required to produce stress-cracking. Intrigued by our own success at reproducing this type of service failure in the laboratory we went on to investigate hundreds of other alloy steels of commercial quality. For our test specimens we used strips of the alloys fabricated with several different treatments. These strips were formed into horseshoe-shaped specimens as shown in Fig. 1. Because of the shape of our specimen and the method of applying the stress, we have at all times a graduated stress condition beginning at a minimum near the open ends of the horseshoe and continuing to increase in intensity up to a maximum near the middle of the stressed bend. These specimens were then subected to a laboratory corrosion test which is highly selective

in developing stress-cracking in sensitive metal. With such a test specimen we can combine everything which already has been mentioned in connection with a proper testing technique such as the surface requirements and fabrication treatments. Furthermore, we can introduce in the test a most important factor —that of stress.

We consider stress to be of such importance in corrosion testing certain alloys, that we never send out any test specimens for field service tests, unless some of the group have stress included with the fabrication treatment. Failure by combined stress and corrosion in alloy lined vessels is not a very common occurence and in some special cases causes but little trouble because the products of corrosion or reaction effectively fill the voids and check further attack to the carbon steel backing. However, the formation of open cracks in the alloy surfaces of certain chemical equipment, where corrosion is severe, must be avoided, and to prevent this we have made a special study to learn how it can be accomplished in commercial practice. Of course, this condition assumes much greater importance for solid alloy equipment.

Stress-corrosion cracking in austenitic alloys, like corrosion cracking of brass and the so-called caustic embrittlement of boiler plate, is intergranular in nature. The susceptibility of austenitic alloys to intergranular attack or "sugaring", (*see* Fig. 2) is not always sufficient to produce cracking, though the steel is stressed and subjected to suitable corrosive conditions—some additional factors are undoubtedly involved. At present it appears that this variable behavior is due to some quality or characteristic of

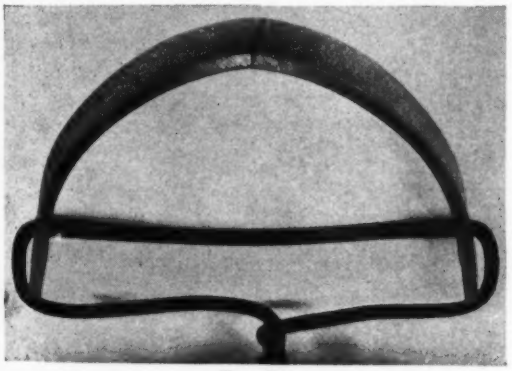

FIG. 3a.

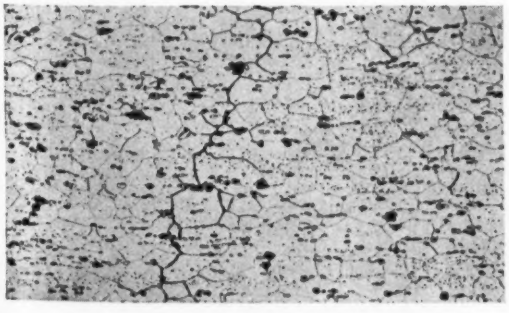

FIG. 3b.

Stress Cracking in a Specimen of Alloy Steel with 0.08 Per Cent Carbon, 25.4 Per Cent Chromium, 3.4 Per Cent Nickel, 1.3 Per Cent Molybdenum. a. Showing Failure of the Horseshoe Specimen. × 1.5. b. Photomicrograph Illustrating Intergranular Path of Rupture. × 100.

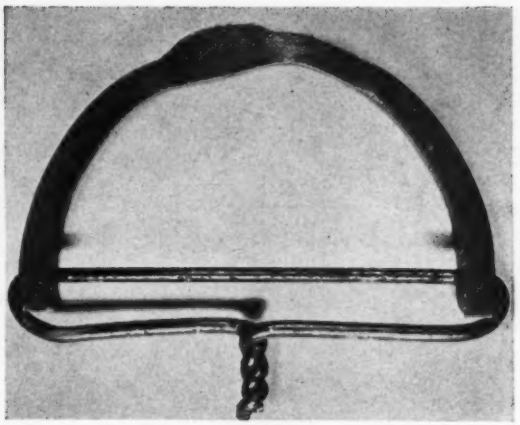

FIG. 4a.

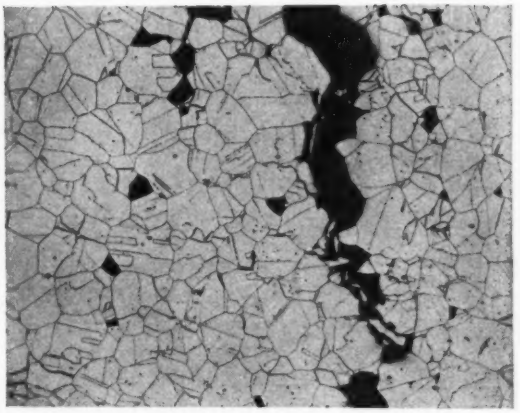

FIG. 4b.

Stress Cracking in a Specimen of Alloy Steel with 0.08 Per Cent Carbon, 18.0 Per Cent Chromium, 10.7 Per Cent Nickel, 2.5 Per Cent Molybdenum. a. Showing Failure of the Field Tested Specimen × 1.5. b. Microstructure at Surface Showing Appearance of Stress Crack. × 100.

the alloys in the as-received condition. Susceptibility to stress-corrosion cracking has been experienced in certain samples of the following alloys:

Cr-Ni, type 304	Cu-Ni
Cr-Ni-Mo, type 316	Nickel
Fe-Cr-Ni-Mo, type 329	Cu-Si
Ni-Mo-Fe	

Macrographs of several of these alloys are shown in Fig. 3 to 6 incl. which illustrate stress cracking in our horseshoe specimens. All of these specimens have been subjected to field service tests. Figure 6 shows a 180 deg. bend on one-half of the horseshoe specimen. This bend test was made in the laboratory, after the specimen had been returned from the field to show the lack of intergranular attack, and demonstrates that the metal remained in a ductile condition after stress corrosion cracking had occurred.

Figures 3, 4, 5, 7 are photomicrographs, which illustrate the intergranular path of rupture in several alloys that failed by stress corrosion cracking after being subjected to field service tests. Quite recently Hodge and Miller *(2)* have reported failures in service of austenitic alloys that were transcrystalline in nature.

In 1931 we made some field corrosion tests of alloy lined specimens which were hung in commercial digesters of various mills in Wisconsin. The results

of these tests were reported before the Technical Association of the Pulp and Paper Industry at the Annual Meeting in New York in February 1933, by Jominy and Archer *(3)*. These tests were made with materials available on the market at the time, and before we had full knowledge of the variable behavior and the many qualities and characteristics of corrosion resisting alloys. At that time we had not developed our present testing technique which permits us to select alloys and be certain of their satisfactory performance in service.

Recent Corrosion Testing Programs

More recently we have engaged in several individual corrosion testing programs with various paper mills. From a series of fabricated alloy specimens submitted to one paper mill for a modified process of pulping, Cr-Ni-Mo, Type 317 was specified as the lining material for two horizontal tumbling digesters, size: 8 ft. 6 in. I.D. by 12 ft. 4½ in. overall length by 1 5/16-in. wall thickness, Fig. 8. To meet the requirements of fabrication, heats of this alloy then had to be selected. Both digesters have been in service for about one year and are in excellent condition.

Another paper manufacturer wanted to replace a carbon steel liquor heating tank which was showing a corrosion rate of 1 in. per year. Fabricated alloy specimens of 7 types of austenitic Cr-Ni alloy, 2 types of high chromium alloys, 2 grades of Hastelloy, and one nonferrous copper alloy were tested under operating conditions. Many of the Cr-Ni alloys showed pitting attack, and the penetration rates were of the order of 0.005 to 0.012 in. per yr., depending upon whether the samples were hung in the liquid zone or in the vapor zone. Hastelloy B was better than Hastelloy A, but the nonferrous copper alloy was completely corroded. One of the straight chromium alloys, Type 430, was pitted and attacked badly in the vapor zone, but Type 329 Cr-Ni-Mo alloy showed up very well. This alloy was selected for lining a replacement tank after our fabricated test specimens had shown corrosion penetration rates of less than 0.001 in. per yr. with no signs of pitting in either the liquid or vapor zones.

During the past two years we have been actively engaged in a program of corrosion testing fabricated alloy lining materials with the Kimberly-Clark Corporation. A recent installation of a large Smithlined storage tank which required field erection of the fabricated parts was a direct result of our program of corrosion testing. The intended service was the storage of raw sulphite liquor at temperatures up to 180 deg. F. and a pressure of 25 lb. per sq. in. and

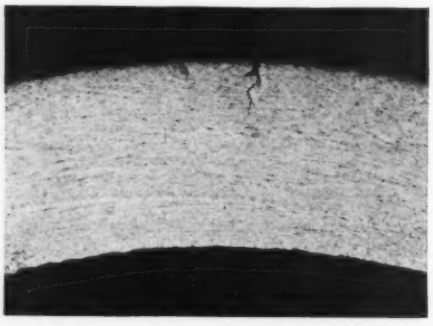

FIG. 5a.

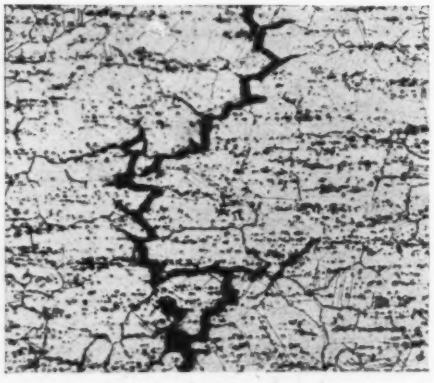

FIG. 5b.

Stress Cracking in a Specimen of Alloy with 0.12 Per Cent Carbon, 63.5 Per Cent Nickel, 29.5 Per Cent Molybdenum, 5.1 Per Cent Iron. a. Micrograph of Stress Cracks in Horseshoe Specimen. × 10. b. Microstructure Through the Failed Area Showing Intergranular Path of Rupture. × 100.

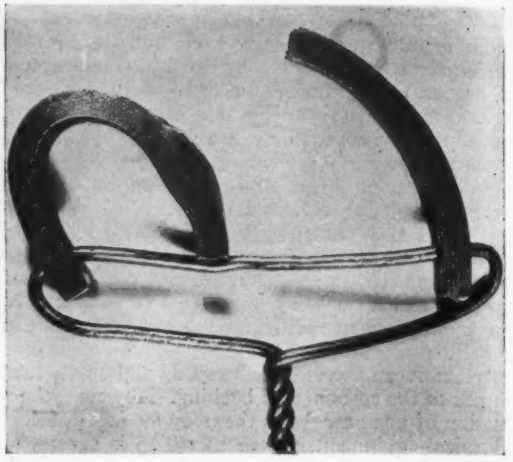

FIG. 6.

Horseshoe Specimen of KA²SM° Steel Subjected to Stress Corrosion Test, Bent After Failure, to Bring Out the Ductility of the Metal and to Show Lack of General Intergranular Attach.

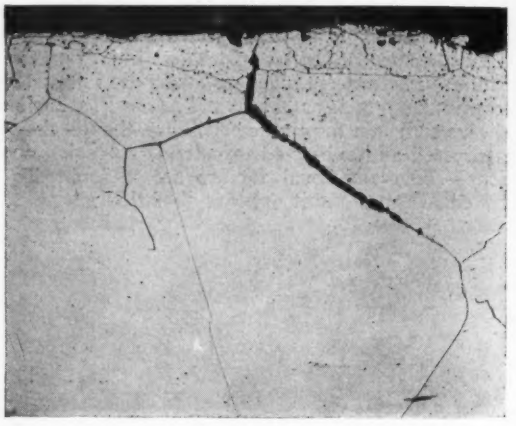

FIG. 7.

Microstructure of Stress Corrosion Sample of Nickel That Failed by Stress Cracking. × 66.

which would allow for a higher concentration of SO_2 than obtainable in wooden storage tanks. Field erection of this tank, 20 ft. 0 in. I.D. by 29 ft. 5 in. between inside surfaces of the heads, meant the selection of alloys which would work out satisfactorily after this treatment. We scheduled our program of test specimens for service testing after a thorough discussion of the field fabricating problems with our engineers. Welding fabrication necessary for field erection was incorporated into our corrosion test specimens in accordance with the designs. Six different types of alloy were made up into stress corrosion specimens for testing under all conditions possible for fabrication, and several surface finishes were

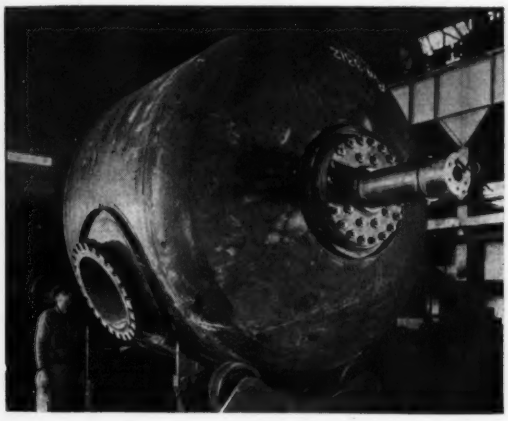

FIG. 8.

represented on these samples. The stress-corrosion test specimens representing these conditions were then exposed to operating service for a long period of time. The results from these tests established that the corrosion conditions were severe and would crack austenitic alloys susceptible to stress-corrosion. In our series of tests were 2 different alloys which from

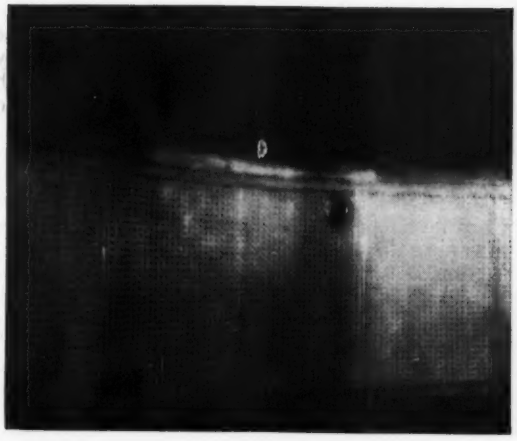

FIG. 11.
Inside View of 20-ft. diam. Smithlined Storage Tank After Field Erection.

previous experience were known to be susceptible to stress-cracking. Specimens of both of these alloys failed in the characteristic manner, and one of the alloys failed by cracking in less than 41 hr. of operating service. The test results obtained by our stress-corrosion specimens indicated to us, that certain alloy types were satisfactory for this service, and that the fabrication treatments necessary to build this tank could be used on alloy materials when properly selected. From this information, lined test plates were made duplicating all of the details of construction and surface finish that might be used in the field erected tank. The alloy surfaces were given special treatments, so that this effect could be studied. These specimens were then subjected to long exposures under operating conditions and after a total exposure of over 1300 hr., during which time the test plates were periodically examined, a thorough inspection of the alloy surfaces was made. These tests indicated that either 18-8 Cb or 18-8 Mo alloys would be satis-

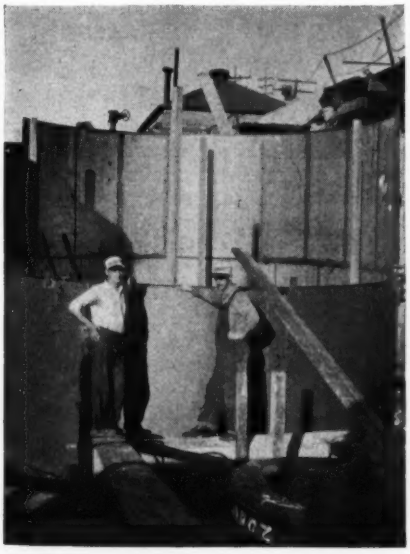

FIG. 9.
View Showing Field Erection of Smithlined Storage Tank 20 ft. 0 in. I. D. by 31 ft. 5 in. overall length for raw sulphite liquor.

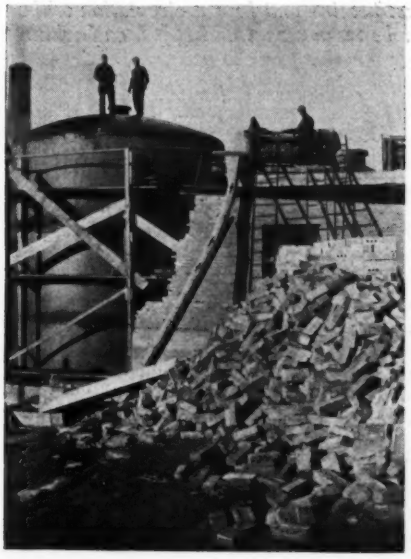

FIG. 10.
View of Storage Tank After Field Erection Was Completed.

factory when properly handled. The tests also proved what our stress-corrosion specimens had previously indicated and furthermore gave us added assurance, that we could satisfactorily field erect this structure with properly selected materials. On the basis of these tests we were prepared to furnish an alloy lining of either columbium stabilized chrome-nickel steel or of chrome-nickel-moly steel. Before these tests we were not certain, that the alloy would be as resistant to pit corrosion as the Cr-Ni-Mo alloy. The test results from our specimens with different surface finishes showed us, that the alloy could be made resistant to this type of attack and resulted in the selection of the lower cost alloy for the lining material. With the difference in the cost between the two alloys, it was possible to prepare the Cr-Ni lining of the field erected tank to the proper corrosion protecting finish and have a substantial saving over the cost of the Cr-Ni-Mo alloy.

The alloy material thus selected was fabricated and erected with the knowledge that we were duplicating in every respect the practice dictated by results obtained from our testing program. A recent inspection of this tank after several months of service shows the lining to be in excellent condition with no evidence of any corrosion. During this period of service the lining has been bottle-tight with no signs of leakage at the weep holes. In this tank there are 1450 ft. of longitudinal and circumferential alloy welding and about 104,000 resistance spot welds which is testimony that our special methods of fabrication and testing enable us to make 100 per cent tests of the lining for bottle-tightness during construction. Figures 9, 10, 11 show views of this tank during erection.

There is undoubtedly a great need for alloy lined equipment in the paper industry. It has, however, been slow in adopting this construction because of the severity of their corrosive conditions and also because of the fabricator's lack of experience and knowledge in this field. The procedure worked out by us now makes it possible to safely consider the use of alloy linings in this service. Where this procedure has been followed, the results to date have been satisfactory.

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(3) Jominy, W. E., and Archer, R. S. *Paper Trade J.* 96, no. 16:28-35 (April 20, 1933); *Tech. Assoc. Papers* 16:203-210 (June, 1933).

The Wallin and Svensson Circulating System*

By Sven Fahlgren[1]

Abstract

A description of the Wallin & Svensson circulating system for sulphite digesters is given and also a review of some practical operating problems encountered in the use of the above method.

Direct heating and forced circulation without direct contact between steam and chips, and without pumps or other moving parts is now a solved problem.

A considerable saving in the quantities of steam and sulphur is effective, and the yield is increased from 15-35 per cent.

Apparatus

The necessary apparatus (Fig. 1) for the W. & S. system are very simple and inexpensive. No pumps or other moving parts are needed. The system consists of: one circulation apparatus for each digester, one acid accumulator, and the necessary pipe lines and valves between the digesters and the accumulator.

The circulating apparatus which is made of stainless steel is installed inside the digester and consists of a circular suction strainer placed in the bottom part of the digester, the same is connected to a vertical pipe line or riser attached to the side wall of the digester. Two steam nozzles are located in the bottom part of the riser. In the upper part are two injectors connected to two nozzles through which sulphur dioxide is injected together with steam from the main steam line.

The acid accumulator is built like a digester and has a volume of 25 to 50 per cent of the largest digester's volume, depending on the number of digesters and the quality of pulp wanted.

Digester Cooking Schedule

After filling the digester with chips which are evenly distributed and packed, the cooking acid is added. The charging of the chips is done with a chip packer. In Scandinavia and nearly all European countries, the Svensson chip filling apparatus is widely used. A 12,300 cu. ft. digester is filled in 90 min. using about 19,000 lb. of steam.

The cooking acid is composed of 75-85 per cent fresh cooking acid, about 15 per cent of acid of high temperature from the acid accumulator, and possibly 5-10 per cent of acid from one of the digesters in line. The last quantity of acid to be used, is added under rather high pressure and, as previously mentioned, is taken either from the acid accumulator or from one of the digesters. At the same time as this last portion of acid is added steam is added through the nozzles at the bottom of the riser which starts the circulation in the digester. It is of importance that the fresh cooking acid is added first in order to get the chips thoroughly impregnated with fresh acid.

The most common procedure is to bring the tem-

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perature up to 230-240 deg. F. in about 3-4 hours. At this temperature some of the liquor is drawn off through the bottom line to the accumulator. A second bleeding is made at 120 deg. C. After that, the temperature is controlled according to the desired quality of the pulp. The total cooking time is usually 10-13 hr., but the plant can be dimensioned for either longer or shorter time.

During the entire cook the upper part of the digesters and the accumulator are interconnected. From the top of the accumulator a pipe line leads to the gas injectors, which are connected to the nozzles in the upper part of the riser. This arrangement makes it possible to obtain a very valuable automatic transfer of sulphur dioxide from digesters with a surplus to digesters which are in an early cooking stage. Because of this movement of a large quantity of SO_2 within the system, a maximum of SO_2 gas is obtained in all the digesters during the greater part of the cook, independent of the strength of new liquor added. During the time when the temperature in the digester is at or above 212 deg. F. the percentage of SO_2 in the gas is from 70-76 per cent. In a digester with a volume of 6,800 cu. ft. the quantity of SO_2 circulating during this time-period is from 1,150-1,250 lb. per hr. and the total gas injected into the digester is 5,800-6,300 cu. ft. per hr.

An automatic regulating valve releases the surplus gas preventing the pressure in the digesters to exceed the fixed maximum. Another regulating valve regulates the gas flow from the accumulator to the circulating apparatus to prevent the pressure from dropping below a fixed minimum.

With the cook finished the digester is cut off from the circulating system and relieved the usual way.

The Blowing of the Digester

As previously mentioned, a chip packer is used in combination with the circulating system. The good distribution and even density of the packed chips in the digester facilitates the circulation of the cooking liquor. An increase in digester yield of 15-35 per cent may raise the question of hangups in the digester. It has been found that in case of no fault in the design of the digester or blow piping and thus no blowing troubles with normal chip filling, the proper use of a chip packer will not cause any hangups or new problems.

Operating Control

By control of the combined SO_2 in the cooking acid, as well as the accumulator, and the raw acid, each digester charge can, without difficulty, be given the same quantity of combined SO_2. Concerning the possible variations in the free SO_2 the same will automatically be smoothed out by the action of the gas injectors during the first hour of steam addition.

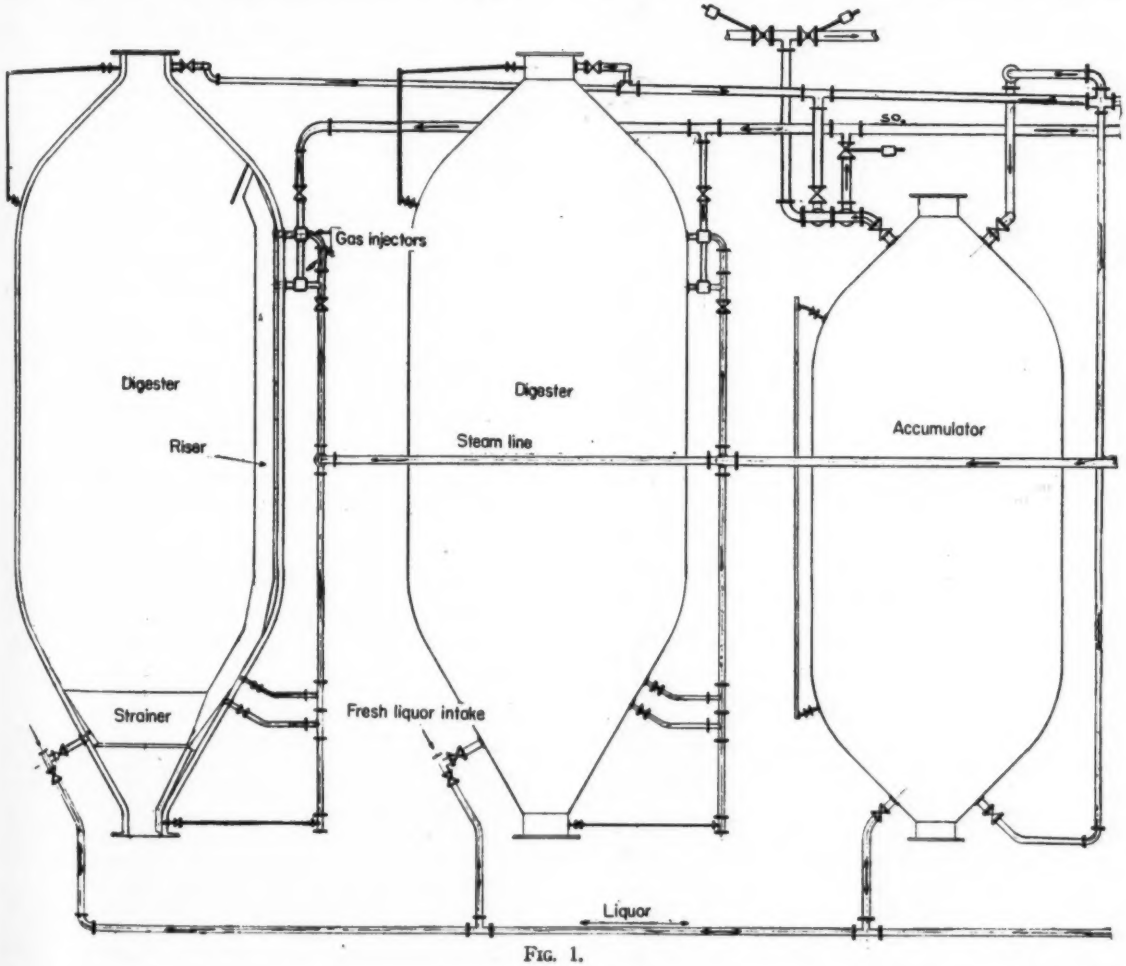


FIG. 1.

Free SO_2 can be added to the last and held at the desired point depending on the quality of pulp wanted.

Fig. 2 shows the uniformity of the liquor taken at three different points in the digester during the cook. At no time does the percentage of SO_2 vary over 0.1 at one per cent.

In Fig. 3 the liquor is taken at two different points in a digester without any circulation system. As shown here the variation in SO_2 at the two sampling points may go as high as 1.6 per cent.

With the possibility of obtaining a cooking liquor of uniform quality, and the possibility to control the maximum and minimum digester pressure, the steam supply and the percentage of SO_2 during the whole cook, the system is especially suitable for the cooking of rayon pulp where absolute control of all variables are of the utmost importance to secure a pulp of uniform quality.

Operating Results

The experience gained in mills operating the system shows that, depending on local conditions of cooking, considerable improvements and saving have been effected.

One mill for instance, manufacturing rayon pulp showed a saving in steam of 25 per cent, sulphur 10 per cent, and with a total cooking time of 12-13 hr. at 285 deg. F. max. gave a yield of approx. 6.5 lb. of unbleached pulp per cu. ft. of digester volume.

Another mill gave the following figures:

Digester capacity	19 ft. x 59 ft.—approx. 11,000 cu. ft.
Cooking time	9 hr.
Temperature	122-298 deg. F.
Yield	35 tons
Total steam	128,000 lb. per cook
Steam per ton pulp	3,660 lb.

By the presteaming of the chips and elimination of air from the digester, which takes place when using the chip packer, and by the excellent circulation in the digester, the variation in temperature throughout the digester is very small. In a 19 ft. by 59 ft. digester the temperature difference between various points in the digester does not exceed 3 deg. C.

Conclusion

With this system sulphite cellulose can be produced by direct heating and forced circulation without direct contact between steam and chips.

The following advantages are obtained:

A perfect, ideal circulation of the cooking liquor
The possibility of holding a stronger liquor concentration during the cook than would be possible without gas circulation
Access to an accumulated reserve of SO_2 gas in the system
Control of the cooking liquor, its strength and composition in the digesters during the entire cook, thus making it possible to produce a sulphite pulp of desired quality
Any desired quality of pulp can be made and repeated one cook after the other
A considerable saving of steam and sulphur an increase in yield of 15-35 per cent .

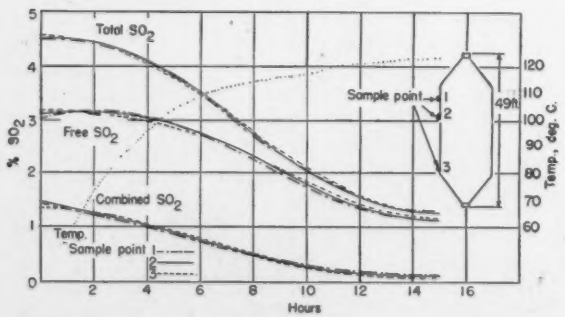


FIG. 2.

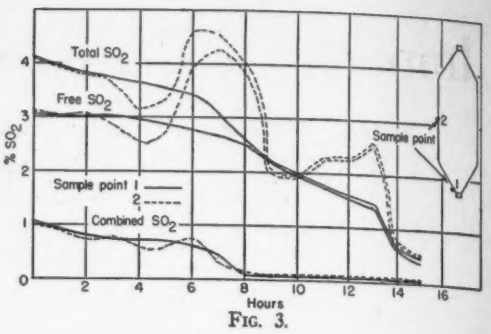


FIG. 3.

A considerable saving of wood due to a better and more even digestion and, therefore, a better pulp with much less screenings
No danger of overcooking, therefore, no losses
An easy to run and controllable digester room.

It has been shown that by virtue of great simplicity in design and no moving parts the system offers definite advantages in regard both to low first cost and to low cost of operation and maintenance.

Patent Reference

U. S. Patent no 1,981,759 Circulation processes and devices in sulphite cellulose digestion.

TAPPI Notes

The New England Section of TAPPI will meet at the Webber Duck Inn, Wrentham, Mass. on Friday, April 26. Members wishing to visit the mill of Bird and Son in East Walpole will be welcome. Cylinder machine operation will be discussed.

A. W. S. Bull, formerly chemist for Dominion Cellulose, Ltd. is now chemist for the Canadian Breweries, Ltd., Toronto, Ont.

Marc Rolland is now general superintendent of the Rolland Paper Company, St. Jerome, P. Q.

Gerard Larocque is now technical director of the Rolland Paper Company.

R. T. Petrie, formerly of the Bagley & Sewall Company is now sales engineer for the Black-Clawson Company, Portland, Ore.

Charles Di Carlo, formerly of the Upsom Company is now chief of the Wausau Paper Mills, Brokaw, Wis.

Carl Magnus, formerly of the Waterfalls Paper Company is now general manager of the Wausau Paper Mills, Brokaw, Wis.

Harry Hulmes, Jr., formerly sales representative of the Moore & White Company is now representing the U. S. Rubber Company in Philadelphia.

The Mysore Paper Mills of Bangalore, India has become a corporate member of the Technical Association.

The summer meeting of the Canadian Technical Section will be held on June 13-15 at Grand Mere, P. Q.

Riegel Paper Corp. Run Normal

MILFORD, N. J., April 7, 1940—The Riegel Paper Corporation, continued production under normal conditions during the first few days of April, when local flood conditions caused a suspension in operations at other industrial plants at this place. When the waters of the Delaware River began to rise to flood height, the flood gates at the mill were closed and pumping station was placed in service, continuing under 24-hour operation for several days until the danger was past.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING APRIL 13, 1940

SUMMARY

Cigarette paper.....188 bbls., 978 cs.
Newsprint .....2,820 rolls
Wrapping paper .....281 bls., 1,137 rolls
Drawing paper.....8 cs.
Miscellaneous paper.....15 bls., 24 cs.

CIGARETTE PAPER

De Manduit Paper Corp., ——, Havre, 335 cs.
Wedeman & Godknecht, ——, Havre, 231 cs.
De Manduit Paper Corp., ——, Havre, 303 cs.
Braunstein Freres, Inc., ——, Havre, 67 cs.
Clark Fruitier, ——, Havre, 26 cs.
——, Exeter, Marseilles, 16 cs., 188 bbls.

NEWSPRINT

Jay Madden Corp., *Southfolk,* Hommelvik, 110 rolls.
H. Reeve Angel & Co., Inc., *Marisa Thorden,* Mantyluoto, 734 rolls.
Jay Madden Corp., *Marisa Thorden,* Mantyluoto, 1,976 rolls.

WRAPPING PAPER

Alfred Bleyer & Co., *Marisa Thorden,* Mantyluoto, 138 rolls.
Equitable Paper Bag Co., Inc., *Marisa Thorden,* Mantyluoto, 95 bls., 494 rolls.
Walker Goulard Plehn Co., *Marisa Thorden,* Mantyluoto, 27 rolls.
H. Fuchs & Son, *Marisa Thorden,* Mantyluoto, 77 bls.
J. B. Harris & Co., Inc., *Marisa Thorden,* Mantyluoto, 74 rolls.
Superior Paper Co., *Marisa Thorden,* Mantyluoto, 109 bls., 66 rolls.
L. Glickman & Co., *Marisa Thorden,* Mantyluoto, 338 rolls.

DRAWING PAPER

Favor Ruhl & Co., ——, Havre, 2 cs.
The Morilla Co., Inc., *Exeter,* Marseilles, 6 cs.

MISCELLANEOUS PAPER

Coty, Inc., ——, Havre, 3 cs.
R. F. Downing & Co., ——, Havre, 2 cs.
American Express Co., ——, Havre, 2 bls.
Hudson F'd'g Co., ——, Havre, 13 bls.
Singer Manfg Co., ——, Kobe, 19 cs.

Rags, BAGGINGS, ETC.

Continental Bank Trust Co., ——, Havre, 490 bls. rags.
A. W. Fenton, Inc., *Molda,* Buenos Aires, 32 bls. rags.
Continental Bank Trust Co., ——, Havre, 130 bls. bagging.

CASEIN

A. Hurst & Co., *Molda,* Buenos Aires, 50 bags.

WOOD PULP

Gottesman & Co., Inc., *Southfolk,* Hommelvik, 1,250 bls. unbleached pulp, 254 tons.
Bulkley Dunton Pulp Co., Inc., *Southfolk,* Hommelvik, 352 bls. sulphite pulp, 71 tons; 900 bls. dry sulphite pulp, 152 tons; 666 bls. kraft pulp, 112 tons.
Pulp Sales Co., Inc., *Marisa Thorden,* Mantyluoto, 3,500 bls. prime strong sulphite, 700 tons.

WOOD PULP BOARDS

Jay Madden Corp., *Marisa Thorden,* Mantyluoto, 662 bls., 622 rolls.
Johaneson Wales & Sparre, Inc., *Marisa Thorden,* Mantyluoto, 989 rolls, 244 tons.

PORTLAND IMPORTS

WEEK ENDING APRIL 13, 1940

Price & Pierce, Ltd., *Glimmaren,* ——, 636 bls. unbleached sulphite.

BOSTON IMPORTS

WEEK ENDING APRIL 13, 1940

Pagel Horton & Co., Inc., *Glimmaren,* Sweden, 1,500 bls. wood pulp.

NEW LONDON IMPORTS

WEEK ENDING APRIL 13, 1940

Price & Pierce, Ltd., *Kanangoora,* ——, 9,000 bls. unbleached sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING APRIL 13, 1940

——, *Southfolk,* Oslo, 96 rolls paper.
J. Andersen & Co., *Southfolk,* Hommelvik, 1,248 bls. dry kraft sulphate, 221 tons.
Jay Madden Corp., *Marisa Thorden,* Mantyluoto, 873 bls. wood pulp boards, 123 tons; 1,278 rolls wood pulp boards, 185 tons; 424 rolls newsprint.
Wilder Bros., *Marisa Thorden,* Hommelvik, 356 rolls, 68 bls. wrapping paper.
E. Q. Twitchell, Inc., *Marisa Thorden,* Mantyluoto, 700 rolls wrapping paper.
Terminal Paper Co., *Marisa Thorden,* Mantyluoto, 848 pkgs wrapping paper.

BALTIMORE IMPORTS

WEEK ENDING APRIL 13, 1940

Jay Madden Corp., *Marisa Thorden,* Mantyluoto, 482 rolls newsprint.
Pulp Sales Corp., *Marisa Thorden,* Mantyluoto, 508 bls. dry mechanically ground pulp, 101 tons; 745 bls. prime strong sulphite, 149 tons.
Price & Pierce, Ltd., *Danaholm,* ——, 3,000 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Rydboholm,* Sweden, 1,825 bls. wood pulp.

LOS ANGELES IMPORTS

WEEK ENDING APRIL 13, 1940

——, *Besholt,* Shanghai, 4 tons paper stock.
——, *Rosebank,* Powell Rover, 891 pkgs. newsprint.
——, *Tatuta Maru,* Tokyo, 1 cs. writing paper.

Ben M. Thomas Goes to Elkhart

R. L. Snideman, president and general manager of the American Coating Mills, Inc., Elkhart, Indiana, has announced the appointment of Ben M. Thomas, as works manager, in charge of all production of the company's paperboard mill, folding carton plant and corrugated box plant at Elkhart. Mr. Thomas will be assisted by Messrs. Brown, Scheide and Hoffman, who have been superintendents of the respective plants for the past several years.

Mr. Thomas has been associated with the Container Corporation of America for the past several years, as plant manager of its Philadelphia property. He has been very active in the paperboard and carton industry and is a member of the executive committee of Technical Association of the Pulp and Paper Industry.

H. Laegerloef To Present Portrait

A portrait of King Gustaf III of Sweden who reigned from 1746-92 will be presented to the 107th Infantry, New York National Guard, by the infantry regiment of Gotland. The presentation will be made by Hans Lagerloef, president of the Lagerloef Trading Company, 52 Vanderbilt avenue, New York, on April 26 at the old Seventh Regiment headquarters at 643 Park avenue. Gustaf III was King of Sweden at the time that country recognized the independence of the new-born United States of America. King Gustaf is said to have been the first ruling monarch to recognize the independence of this country. Coming at a time when the future of Sweden is uncertain, the gift by the old Swedish army unit is of uncommon interest.

Hans Lagerloef who observed his sixtieth birthday last month was honored by the following appreciation which appeared in the March 27 issue of the *Svenska Daglatet* of Stockholm.

"NEW YORK, N. Y., March 26—Hans Lagerloef, the prominent Swedish-American business man, who will be 60 on Friday, has been the object of enormous tributes from a great number of Swedish-American societies and associations. Not less than one-half dozen societies and associations representing sports, philately and charity have made Lagerloef an honorary member.

"It is really in the capacity of donor to the Swedish Postal Museum that Director Lagerloef is known here. The first donation was made in 1922 and has been followed with a long list of others. The value of these donations runs into hundreds of thousands of kronor. Now and then Director Lagerloef has donated large amounts for charity of different natures such as the fighting of infantile paralysis and also W. R. Lundgren's skollovs-och feriefond. Sports have had in Hans Lagerloef a benefactor. He is a vigorous hunter and loves nature and the outdoors and is a warm friend of all sports and shooting and he has helped a long line of different athletic clubs and kindred associations."

Canada Sets $50 Newsprint Price

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 17, 1940 — Although no general official statement has been issued, it is a foregone conclusion that the present contract price of fifty dollars per ton will prevail for all newsprint companies in the third quarter of the year. Here is a typical letter received today from a leading producer.

"Because of the uncertain outlook in world affairs, we believe the best contribution we can make to the solution of one of our mutual problems, is to help preserve stability in the market for newsprint paper. Therefore, we have decided to maintain our present contract price for standard newsprint without change until September 13, 1940."

Northern Mills Earnings Rise

The Northern Paper Mills and subsidiaries—for 1939 report a net income of $240,133, equal to $2.85 each on 71,967 shares of common stock, contrasted with a net loss of $102,490 in 1938.

Conditioning Reduces Paper Complaints

Complaints and rejections on their manufactured paper products have been reduced to a minimum and, in many cases, sales resistance has been overcome as a result of the installation of two air conditioning units in their plant, it was revealed last week by the Mead Corporation, paper manufacturers, om Chillicothe, Ohio. Back in 1937, serious complaints from customers had been piling up on the desks of executives of the company about their finished paper products, among them "Moistrite." It was claimed the paper did not seem to maintain a proper amount of moisture.

They called in air conditioning engineers from the Carrier Corporation, Syracuse, N. Y. air conditioning firm, who diagnosed the problem and made recommendations which resulted in the installations of two separate jobs.

Two conditioning units were required to handle the first job. The units were designed to maintain a controlled humidity and heating condition in the Finishing Department during the winter and to supply some cooling effect during the Summer. This department comprises the paper sorting, cutting and storage room and contains up to 120 employees. The floor space is approximately 40,550 square feet and the room volume is approximately 609,999 cubic feet.

The second job was in the paper moistening room, which has to be carried at a fairly high relative humidity to add the proper amount of moisture to the paper. The floor space in this room is approximately 1,575 square feet and the room volume is approximately 28,350 cubic feet. The room normally contains only two employees.

It is estimated that the cost for power and water on all the above equipment averages about $2.75 per day. The maintenance charges have not been kept separate, but these are said to be very low. Officials of the firm estimate that the cost per ton of product for operation of this equipment is difficult to figure, but averages probably not over 5 cents.

In the finishing room, temperature is maintained at a minimum of 75 deg. and humidity at a minimum of 45 per cent. These conditions prevent moisture from escaping from the paper and causing curl, static electricity and other troubles which were serious before this installation was made. In the second job, or paper moistening room, temperature is maintained at 84 deg. and humidity at 80 per cent. These conditions have been found satisfactory for introducing moisture into the paper with the equipment available. Before the installation of Carrier equipment it was very difficult, to get the required moisture content in certain types of paper.

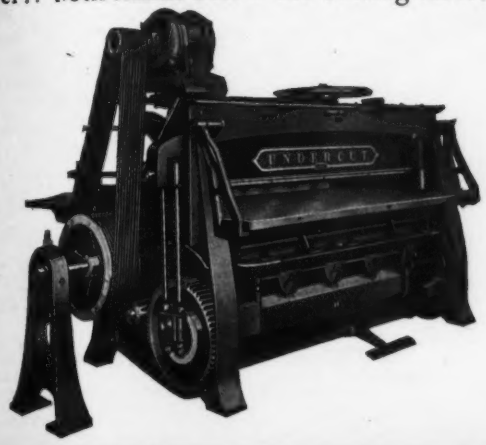
To Make Containers at Jacksonville

JACKSONVILLE, Fla., April 15, 1940—Manufacture of corrugated shipping containers, according to the *Journal*, will get underway in Jacksonville in about six months.

The National Container Corporation will lease the municipally-owned cotton compress building and property on Talleyrand avenue and convert it into a box-making plant. Alterations and installation of machinery will take about six months, according to Samuel Kipnis, president of the corporation. About 150 persons will be employed when the plant goes into operation.

THE SAFE *Undercut*

Two distinct throws of the starting lever.. both hands below the cutting table...



then *only* can the knife start to cut... that's complete safety ... Dual Control!

Dual Control ends danger of accidental starts. A visitor leaning on the control mechanism, a worker brushing against the cutter, a sudden jar, will have no effect. At all times, the operator has complete command of the cutting stroke. *Now*, with perfect safety, all operating mechanism is placed within easy reach. Faster work, fewer motions, greater accuracy is possible

The SMITH & WINCHESTER Manufacturing Company

SOUTH WINDHAM CONNECTICUT 2

MEET THE MEN WHO SELL ORR FELTS

If you have a felt problem, here are the men to help you solve it. Mr. Eilers, dean of the "force," has been contacting the mills, for many years. The same holds true of Messrs. Purdy, Scott, Hodges and Casparis. If these men have cooperated on one felt problem, they have cooperated on a thousand. Why not take advantage of their broad experience?

And remember this—the superior water removal qualities and longer wear of Orr Felts account for the Orr plant being the largest felt mill in the world.

THE ORR FELT AND BLANKET COMPANY
Piqua, Ohio

ORR FELTS

New York Paper and Pulp Market Review

Pulp Prices Nominal Due To Critical Situation In Scandinavia and Stoppage of Pulp Imports From Northern Countries — Some Paper List Prices Withdrawn—Few Paper Stock Prices Nominal—Mixed Paper Up

Office of the PAPER TRADE JOURNAL,
Wednesday, April 17, 1940.

The wholesale paper market is reported as firm and while no important advance in prices are quoted, discounts have been cancelled in most cases and list prices have been withdrawn by many manufacturers. No scarcity of paper is, of course, expected and a buying splurge such as occurred last Fall is not expected in the trade at this time. The pulp situation is critical but there is no immediate pulp shortage foreseen. The possibility that the pulp situation may become serious in the future has created anxiety regarding the future supply of many grades of paper, but no definite factual basis for this concern is reported at this date.

The index of general business activity for the week ended April 6, declined to 93.0 per cent, from 93.8 per cent for the preceding week, compared with 86.9 per cent for the corresponding week last year.

Paper production of 199 mills for the week ended April 6 was estimated at 80.5 per cent, compared with 84.7 per cent for 1939, with 67.3 per cent for 1938, with 92.4 per cent for 1937, and with 82.9 per cent for the corresponding week in 1936.

Paper board production for the week ended April 6 was 68.0 per cent, compared with 71.0 per cent for 1939, with 58.0 per cent for 1938, with 87.0 per cent for 1937, and with 68.0 per cent for the like week in 1936.

No change of importance has been reported in the newsprint market this week. The International Paper Company has announced it will maintain its price of $50 per ton through the third quarter of the current year.

Mechanical Pulp

The mechanical pulp market is firmer as the result of the critical situation now prevailing in the foreign and domestic pulp industries. Domestic production of groundwood continues at a high level.

Chemical Pulp

Hostilities in Europe have stopped all shipments of pulp from Sweden, Norway, and Finland. As dealers have little it any stocks to offer, prices are nominal at this date on all grades of foreign and domestic pulp.

Rags

Demand continues rather slow in the rag market with trading largely in new white and unbleached grades. Prices hold unchanged at this date.

Old Rope and Bagging

The old rope market is reported very firm under reports of restricted shipments of old rope from overseas. Prices hold unchanged for the week.

The old bagging market is reported slow with the outlook viewed in some quarters of the trade as improved, based upon scarcity due to restricted imports. Prices hold unchanged.

Old Waste Paper

Quotations on some grades of old waste paper, such as old kraft, machine compressed bales, are nominal at this date. Prices on strictly foled news have advanced to .42½ to .45; corrugated to .42½ to .45; and No. 1 mixed paper to .27½ to .30.

Twine

Higher prices on some imported fibers are looked for in the trade. Prices hold firm and unchanged for the week on all grades of hard and soft fiber twines.

Productivity and Income

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 17, 1940—Brookings Institution last week made public a study of productivity in relation to the distribution of income, in major divisions of American industry which account for approximately 75 per cent of industrial wages and employment.

The study shows that consumers have received large benefits from increases in productive efficiency since the early 'twenties. Labor received higher hourly wages, but, in consequence of shortened hours and unemployment, aggregate wages did not increase; such gains as labor in general received were thus in the form of lower prices and greater leisure. The return on invested capital declined.

In connection with paper and allied industries, the study said:

"Productivity rose 52 per cent between 1923-24 and 1936-37, and output rose approximately as much.

"Aggregate wage payments rose more than man-hours, but somewhat less than the number employed. The wage earners received increases in hourly earnings of 9.6 per cent in dollars, and 26.1 per cent in 'real wages.' Aggregate dollar earnings per worker, however, were less because of the shortening of hours of employed labor.

"Gains to consumers of paper and allied products were very substantial—assuming the same increase in productivity, in the entire industry, as was found in paper and pulp, they amounted to approximately 40 per cent in terms of real products.

"The increase in technological progress in this essentially consumer goods industry compares favorably with mass production heavier industries. The rise in productivity, at least in the paper and pulp division (which represents 57 per cent of the total), was greater than in the automobile industry and fully as extensive as in iron and steel. Moreover, the man-hours of employment increased about 8 per cent, whereas in the automobile industry it was barely maintained and in the iron and steel industry it decreased 25 per cent."

EVEN A SMALL REJECT LOT–

–AND ANOTHER–

–AND ANOTHER–

MICROMETER ROLLCALIPER

Product of

LOBDELL CAR WHEEL CO.

Wilmington, Del.

ADDS UP TO A LOSS YOU CAN'T AFFORD TO TAKE!

. . . that's why leading mills use an accurate instrument to keep constant check on calender and press rolls . . . saving thousands of dollars annually by an investment that writes itself off at 69c a day! Nearly 100 of them use the Lobdell Micrometer Roll Caliper . . . light in weight, easy to handle, quickly adjustable to a wide range of roll diameters. Ask about it; write for details.

Specify Textile

CALENDER ROLLS

made with 100 YEARS EXPERIENCE

NEW AND REFILLED COTTON ROLLS

AND PAPER ROLLS FOR ALL CALENDERS

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 17, 1940.

BLANC FIXE—Prices on blanc fixe are firm and continue unchanged at prevailing market quotations. The pulp is currently quoted at $35 per ton, in barrels, at works. The powder is quoted at $50 per ton, f.o.b., works.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand moderate. Prices unchanged. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are a little lower on some grades this week. Standard domestic, 20-30 mesh, is currently quoted at from 9½ to 10½ cents per pound; 80-100 mesh, at from 10½ to 11½ cents per pound. All prices in bags, car lots. Argentina casein is currently quoted at 10 cents per pound; French casein at from 14½ to 15 cents per pound.

CAUSTIC SODA—Quotation on caustic soda are firm and unchanged, with trading continuing moderate in volume. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and continue unchanged for the week. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotation on chlorine are firm and unchanged. Demand moderate. Prices unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm, with prices lower for the week. "G" gum rosin is currently quoted at $4.95 per 280 pounds, gross weight, in barrels, Savannah. "FF" wood rosin is currently offered at $4.90 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.75 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake are firm. Demand moderate. Prices unchanged and nominal. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome salt cake at $16 per ton all prices in car lots, f.o.b., shipping point. Imported salt cake quoted at $20 per ton is nominal. February imports, 8,908 tons, against 10,457 tons in January.

SODA ASH—Prices on soda ash are firm and continue unchanged at prevailing market quotations. Demand reported moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—Quotations on corn starch are firm and unchanged at prevailing market levels. Pearl is currently quoted at $2.70 per 100 pounds; powdered starch at $2.80 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices on sulphate of alumina are firm. Demand continues moderate. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Quotations on sulphur are firm and continue unchanged at prevailing market prices. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Prices on talc continue firm and unchanged at prevailing market quotations. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $23 to $45 per ton.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.00	@	$5.50
Superstandard	4.62½	"	5.00
Northern Standard Wrapping	4.25	"	4.62½
Standard Wrapping	4.00	"	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	"	—
White No. 1½	.70	"	—
White No. 2	.65	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.87½	"	—
Kraft	.80	"	—
Manila	.65	"	—
Unbl. Toilet, 1 M.	3.50	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	1.95	@	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	—
White Pat. Coated	67.50	"	—
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10 @ $46.00		$40.25 @ $47.25
100% Rag	31.05 " 36.50		32.20 " 37.75
85% Rag	.... "		29.90 " 35.00
75% Rag	23.60 " 27.75		24.75 " 29.00
65% Rag	.... "		21.65 " 26.25
50% Rag	17.55 " 21.50		18.70 " 22.75
25% Rag	14.65 " 17.75		15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.95 @ $11.00	$10.10 @ $12.25
No. 2	8.05 " 9.75	9.25 " 11.25
No. 3	7.60 " 9.25	8.50 " 10.75
No. 4	7.30 " 9.00	8.50 " 10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	$38.00	@	44.00
Dry	38.00	"	44.00

(Delivered)

No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.00	@	3.10
Prime Qualities—Easy-Bleaching Sulphite	2.75	"	2.85
Strong Unbleached Sulphite	2.75	"	2.85

(On Dock, Atlantic Ports)

Kraft Bleached	3.37½	@	3.50
Kraft Light & Strong	2.50	"	2.75
Kraft No. 1	2.40	"	2.65

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	2.00	"	2.25

(Delivered)

Soda Bleached	2.90	"	—

Above pulp prices nominal.

Add 60 cents per short ton, for charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.25	@	7.50
Silesias No. 1	4.50	"	4.75
New Unbleached	7.25	"	7.50
Blue Overall	4.75	"	5.00
Fancy	2.25	"	2.50
Washables	2.00	"	2.25
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.35

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.10	"	1.15
No. 2	.90	"	.95
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.25
New Light Silesias	1.50	"	1.75
Light Flannelettes	1.50	"	1.75
New White Cuttings	7.00	"	4.50
New Light Oxford	4.00	"	4.25
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.00
No. 2 White Linens	6.50	"	7.00
No. 3 White Linens	4.50	"	—

The Nekoosa Portable Wood Peeler Readily Adaptable to Varied Conditions

View of feed side of new mechanical peeler.

The fact that the Nekoosa Peeler is easily portable makes it readily adaptable to a variety of operating conditions. It is also provided with numerous adjustments which enable it to peel many species of wood in different stages of seasoning.

The flexibility of the machine is a feature which will make it fit into your wood cleaning operations.

Nekoosa Foundry & Machine Works, Inc.

NEKOOSA, WIS., U. S. A.

"NON-USERS ARE THE LOSERS"

TENAX FELTS

FINISH AND SPEED

TAKE STOCK - THEN LOOK AHEAD!

How did your felts stand up to their duty this past year? If they were TENAX FELTS youall and weall know the answer,—TENAX FELTS have led the production procession for fifty interesting and profitable years.

Let's not rest on the record. If you are equipped with TENAX FELTS let us give you some service; if not, let us tell you their proud and economical story.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

NEWFANE, N. Y.—U. S. A.

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging.....	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads.....	3.00	"	3.25
Sisal Strings.....	2.00	"	2.25
Mixed Strings.....	.70	"	.85

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1...	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag....	1.00	"	1.10
Solid Flat Book...	.57½	"	.62½
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	1.60	"	1.70
Ledger Stock Colored	1.05	"	1.15
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine—(Nominal)			
Compressed bales..	1.05	"	1.15
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	.70	"	.75
Strictly Folded....	.42½	"	.45
Corrugated	.42½	"	.45
No. 1 Mixed Paper..	.27½	"	.30

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18½	@	—
White Hemp.....	.18½	"	—
Fine Polished—			
Fine India.....	.23	"	—
Unpolished—			
Box	.14¾	"	—
Paper Makers.....	.15	"	—
Tube Rope.....	.16¼	"	—
Wall Paper.....	.15¾	"	—
Wrapping	.18	"	—
Soft Fiber Rope...	.16¼	"	—
Cotton	.21	"	—

(Hard Fiber)

Medium Java.....	.19	"	—
Mex. Sisal.....	.16	"	—
Manila	.24	"	—
Domestic	—	"	2.50
Sisal Rope.....	2.20	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	3.50	@	—
Soft Jute Ropes.....	3.00	"	3.50
Manila Rope—			
Foreign	4.50	"	4.75
Jute Carpet Threads.	1.50	"	1.75
Gunny Bagging—			
Foreign	3.20	"	3.25
Domestic	2.50	"	3.00
Bleachery Burlap....	3.50	"	3.75
Scrap Burlap—			
Foreign	2.50	"	2.60
Domestic	2.50	"	—
Scrap Sisal.....	2.50	"	2.60
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy..	2.50	"	2.65
New Burlap Cuttings	3.25	"	3.50
Aust. Wool Pouches.	2.90	"	3.15
Heavy baling bagging	2.60	"	2.90
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.85	"	.90

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	—	"	.07½
New Light Flannelettes	.05	"	.05¼
Silesias No. 1	.05	"	—
New Black Silesias..	3.20	"	3.25
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04½	"	.05
New Black, Soft..	.03	"	.03½
Khaki Cuttings.....	.03	"	.03½
O. D. Khaki.....	.03	"	—
Corduroy	.02¼	"	.03½
New Canvas.....	.06¼	"	.07
B. V. D. Cuttings...	.07	"	.07½

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	—	"	2.75
Miscellaneous	2.00	"	2.50
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.50	"	2.00
Old Blue Overalls ..	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.00	"	1.35
No. 2.....	—	"	1.10
No. 3.....	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White No. 2.	.04	"	.04½
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached..	.05½	"	.06
Washable, No. 1..	—	"	.04
Blue Overall.....	.04½	"	.05
Cottons—According to grades—			
Washable No. 2...	—	"	.01¾
New Blue	—	"	.01¾
Fancy Percales....	—	"	.03
New Black Soft...	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.55
Khaki Cuttings—			
No. 1 O. D.....	.03¼	"	.03½
No. 2 Mixed.....	.02½	"	.02¾
Corduroy	—	"	.02
New Canvas.....	.05½	"	.06
New Black Mixed.	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	—	"	1.50
Repacked	1.75	"	2.00
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	—	"	.90
Domestic No. 2...	—	"	.80
Roofing Bagging..	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.50	@	3.00
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	1.00	"	1.25
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	1.10	"	1.15
Wool Tares, heavy..	3.50	"	3.70
Mixed Strings	.75	"	1.00
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard Write	2.25	@	2.30
No 2 Hard White	2.00	"	2.10
No. 1 Soft White	1.85	"	1.90
No. 2 Soft White	1.50	"	1.60
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.50	"	1.60
Ledger Stock, white.	1.40	"	1.45
Ledger Stock, colored	1.10	"	1.20
No. 1 Books, heavy..	.85	"	.90
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.50	"	.55
Container Manila....	.40	"	.45
Kraft Paper.....	1.00	"	1.10
No. 1 Mixed Paper..	.25	"	.30
Straw Board Chip...	—	"	.40
Binders Board Chip..	.40	"	—
Corrugated Board....	.50	"	.60
Overissue News.....	.70	"	.75
Old Newspapers.....	.40	"	.45

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White	1.85	"	2.15
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.30	"	—
Overissue Ledger Stock	1.30	"	1.50
Mixed Ledgers.....	.85	"	.90
No. 1 Books, heavy..	1.00	"	1.10
No. 1 Books, light..	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.70	"	1.85
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.25	"	1.30
Mixed Papers.....	.20	"	.22½
Print Manila.....	.50	"	.55
Container Manila...	.60	"	.70
Old Newspapers.....	.40	"	.45
Paper Wool Strings..	.90	"	1.00
Overissue News.....	1.00	"	1.10
Box Board Chips....	.35	"	.40
Corrugated Boxes...	.40	"	.45
Kraft corrugated boxes	.95	"	1.00
New Kraft Cuttings.	1.35	"	1.45
Screening Wrappers	.60	"	.70

Bagging

(f.o.b.Boston)

Gunny Bagging—			
Foreign	—	"	2.85

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots.			
No. 1 White $36.50		@	—
No. 1 Tints	37.50	"	—
No. 2 White	26.50	"	—
No. 2 Tints	27.50	"	—
No. 2 Golden Rod..	28.50	"	—
No. 3 White	22.00	"	—
No. 4 White	15.50	"	—
No. 4 Tints	16.50	"	—
No. 4 Golden Rod..	17.50	"	—
Direct mill shipment in three-ton lots.			
No. 5 White $10.40		@	—
No. 5 Tints	11.40	"	—
No. 5 Golden Rod..	12.40	"	—
No. 6 White	9.40	"	—
No. 6 Tints	9.90	"	—
No. 6 Golden Rod..	11.40	"	—
No. 7 White	8.40	"	—
No. 7 Tints	8.90	"	—
No. 7 Golden Rod..	10.40	"	—
Book—			
No. 1 M. F.	$7.75	"	—
No. 2 M. F.	7.25	"	—
No. 3 M. F.	6.60	"	—
No. 1 S. C.	8.25	"	—
No. 2 S. C.	7.75	"	—
No. 3 S. C.	6.25	"	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$12.15		@	—
No. 2	10.50	"	—
No. 3	9.45	"	—
Coated tinted.....	13.20	"	—
Golden Rod.....	14.80	"	—
Wrapping—delivered—			
Rag Brown.....	4.85	"	5.25
White Wrap.....	4.00	"	—
"B" Manila.....	4.90	"	6.15
No. 1 Manila....	$5.50	@	$4.90
Fiber	5.50	"	6.00
Kraft No. 2.....	5.50	"	6.00

(f.o.b. Cars, Toronto)

News per ton—			
Rolls (contract)..	46.00	"	—
Sheets	54.00	"	—

Pulp

Ground wood.....$36.50		@	—
Unbleached sulphite.	54.00	"	—
Bleached sulphite...	65.50	"	—
Kraft	47.50	"	—
Soda	58.00	"	—

Old Waste Paper

(In carload lots, f.o.b. Toronto)

Shavings—			
White Env. Cut...	2.40	@	—
Soft White.....	2.00	"	2.15
White Blk. News..	1.35	"	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	"	1.00
Light and Crumpled Book Stock.....	.80	"	.90
Ledgers and Writings	1.15	"	—
Manilas—			
New Manila Cut..	1.55	"	1.60
Printed Manilas...	.70	"	—
Kraft	1.15	"	—
News and Scrap—			
Strictly Overissue	.75	"	—
Strictly Folded ..	.70	"	—
No. 1 Mixed Paper	.60	"	—

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings..	2.40	@	—
No. 1 Hard White	2.15	"	2.20
No. 1 Soft White.	1.85	"	1.95
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.05
Blanks	1.50	"	1.65
Krafts	1.15	"	1.35
New Kraft Cuts.....	1.40	"	1.60
Overissue News.....	.80	"	1.00
Old Newspapers—			
No. 1 Folded News	.65	"	.75
No. 1 Mixed Paper	.35	"	.55
Roofing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90